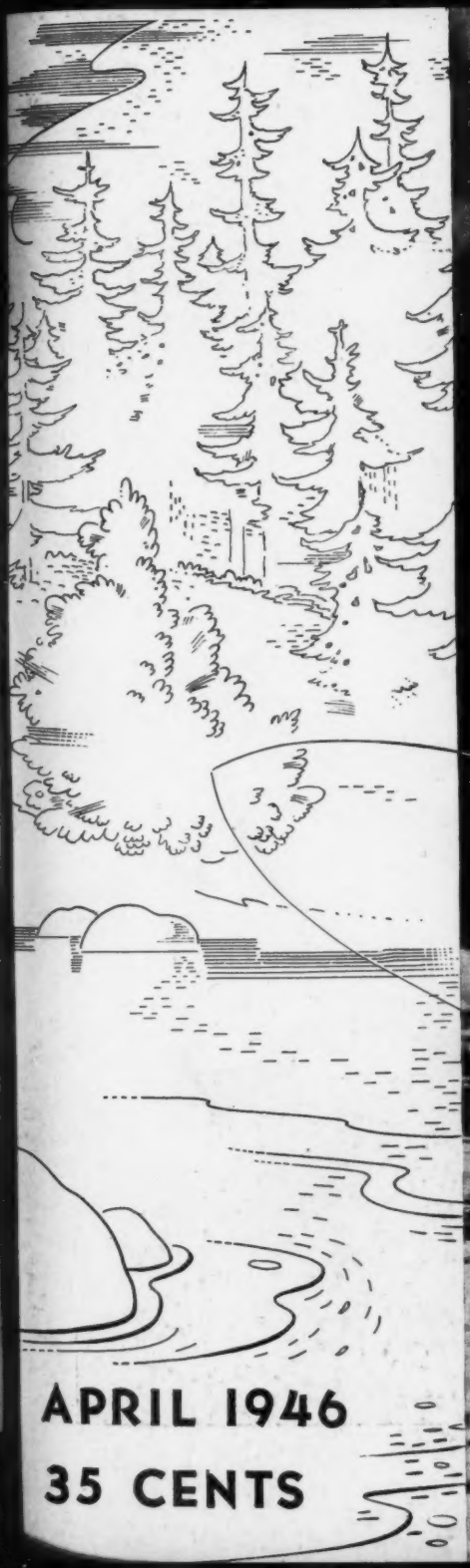
AMERICAN FORESTS



APRIL 1946

35 CENTS

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AMERICAN FORESTS

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Contents

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THE AMERICAN FORESTRY ASSOCIATION

919 SEVENTEENTH STREET, N. W., WASHINGTON 6, D. C.

The Purpose

The American Forestry Association is a national organization—educational in character—for the advancement of the intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is (1) to bring about adequate protection and perpetuation of these resources by creating an enlightened public appreciation of the need of conserving them through wise use for the present and future welfare and enjoyment of all the people; (2) to make available to Americans in all walks of life a wider knowledge and appreciation of their forest resources and the part they can play in the social and industrial life of our nation.

The History MORE THAN half a century ago American men and women of vision, stirred by the rapid destruction of forests and forest life in the United States, began to raise their voices in behalf of conservation. Foreseeing the danger of allowing America's rich forests and vast natural wealth to be thoughtlessly wasted, these public-spirited individuals protested the needless destruction that was taking place. Out of their efforts came a collective force,—The American Forestry Association, first organized in 1875 and made a national influence in 1882.

The Record THUS The American Forestry Association has a long record of efficient public service. The establishment of the United States Forest Service and the creation of the nation-wide system of state and national forests and parks were due in no small part to the Association's efforts. Its educational work, extending over more than seventy years, has stimulated public action and built public support for protection against forest fires and floods; for prevention and control of soil erosion; for the development of conservation policies in forest management for continuous production through wise use; for the control of forest insects and diseases and the preservation of fish and wildlife.

The Support FROM AN ORGANIZATION of a few hundred members three decades ago, the Association has attained a substantial membership of many thousand men and women, living in every state in the Union and in foreign countries throughout the world. The funds of the Association are administered by a Board of Directors composed of individuals of national standing—men and women who give their services free, who have a practical understanding of the nation's present-day conservation needs, and are equipped through experience, ability, enthusiasm and training to advance the Association's program.

The Program BECAUSE OF its independent, non-political character, the work of The American Forestry Association is vitally necessary in the field of public service. It provides an unprejudiced influence for the development of sound conservation measures. It helps coordinate public, state and federal policies. It cooperates closely with federal, state and private agencies in conservation work. At the same time it initiates, sponsors and carries on needed projects in conservation in addition to its regular broad continuous program of education.

Mesquite, cedar elm, or live oak —a famous author cannot decide

By J. FRANK DOBIE

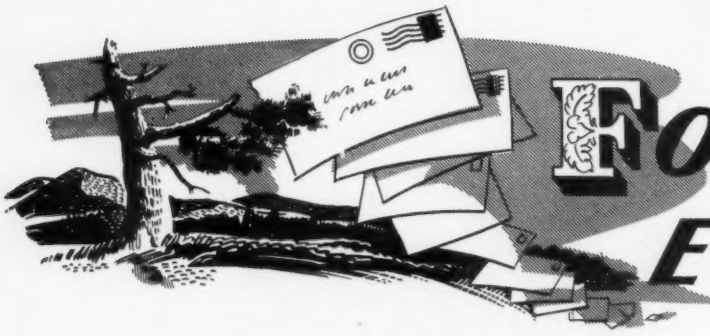
My Favorite Tree

IT is hard for me to be categorical and say absolutely which is my favorite tree. I was born and reared among the mesquites—trees, not mere bushes—of southwest Texas. Their sparse shade kept the blazing August sun off me at times when there was no other shade available, and their beans fed my horse when there was no grass. In the spring when their leaves put on, the yellow-tinged tender green is so evanescent that it floats up into the sky, and then to me there is nothing more lovely than an expanse of leafing mesquites. Because of associations this tree has a deep meaning for me; yet it, with other thorned growth, stabs the earth; it is far from being altogether gracious.

Maybe the cedar elm is my favorite, though does any other tree so combine strength and friendliness as the live oak? I couldn't say that the live oak is not my favorite. In vast areas of the West and Southwest the cottonwood, always by water, is the oasis of all trees. Its leaves talk in the air and bring a great peace to whomever is under them.

The elm seems to take its place in valleys without contending. The oldest elm seems young for a few days every spring, but no other tree grows old with more grace. Again, it is hard to choose between a single lofty, wide-spreading cedar elm standing alone, and a grove of the trees sharing space and harmonizing with each other. The grass under them always suggests to me English swards that have been mowed and fertilized by sheep. In Texas valleys mustang grapevines often completely cover medium-sized elms. No king or theater ever had such majestic, yet also domestic-natured, such flowing drapery. We bought our home because of a great cedar elm in the back yard. If the house burns down, it won't be so bad if the elm is not scorched.

Mesquite tree of the Southwest



FOREST EXCHANGE

Threat to Federal Lands

SIR: As you no doubt are aware, there is a strong effort being made by certain private interests and state officials to secure the transfer of federal lands to the state. Their move appears to have the support of state officials, many senators of the western states and the large livestock growers and timber operators. You know what this means . . . but the public as a whole appears to be offering little or no opposition to the move. Can't something be done to bring citizens to realize what is happening —and have them take prompt and effective action to prevent it?

I know what the result will be if this move is successful. I was born and raised here in the Southwest and have lived in Colorado, New Mexico and Arizona for more than 65 years. I am personally acquainted with some of the sponsors of this move to get control of resources to which they are not entitled. But I lack the means to place the matter before the public in its true light. So I appeal to you and to every liberty loving citizen of this country to do everything possible to block this nefarious scheme.—*J. H. Sizer*, Santa Fe, New Mexico.

For "Hessian Ditch" Readers

SIR: I wish to express my appreciation for the publication of "The Hessian Ditch," by John D. Kendig, in the February issue. It may be of interest that my friend, Professor Herbert H. Beck, president of the Lancaster County Historical Society, read a paper "Cannon Hill and the Hessian Ditch, With Personal Reminiscences of the Furnace Hills," in 1940 and published as Vol. XLIV, No. 2, of the Society.

My boyhood days were spent in Lititz, Lancaster County, and many happy hours were spent in the Furnace Hills, hunting and gathering chestnuts.

And, incidentally, Mr. Kendig failed to mention the beautiful boxwood in the impressive terraced garden and the bed of painted trillium growing in the shade of the mansion. —*James S. Fry*, Nazareth, Pennsylvania.

First Mother's Tree

SIR: It has always been my understanding that the first "Mother's Tree" was planted in Pennsylvania. Recently, however, I have heard it argued that the honor goes to Washington, D. C.—that the first tree was planted in the grounds of the White House? Can you tell me about this? —*B. A. Babson*, Berwyn, Pennsylvania.

(The original "Mother's Tree" was planted in 1923 on the shore of Lake Antietam, near Reading, Pennsylvania, by the late Solan Parkes of that city. The American Forestry Association nationalized the idea and has sponsored many plantings, among them the "Mother's Tree" in the White House grounds, as well as those in grounds of the capitol at Washington and at the Tomb of the Unknown Soldier at Arlington, Virginia. The white birch (*Betula alba. laciniata*) has been designated and accepted as the official "Mother's Tree."—Editor.)

GI Refresher Courses

SIR: A seminar-type course with discussions, supplemented by reference material and case studies will be given by the School of Forestry, Oregon State College, to returning service men who are graduates in forestry. The purpose of the course is to give the returning GI's a chance to catch up on forestry developments. Techniques that have been developed or inaugurated during the past four years will receive special attention.—*Paul Dunn*, Oregon State College.

More Comment on New Format

SIR: I wish to congratulate you on your new format. It is excellent.—*F. B. Hubachek*, Ely, Minnesota.

SIR: When I saw the hideous, straining figure on the January issue, I shuddered and thought 'Yes, this typifies the creature that has come to destroy the beauty and peace of forest life and wilderness trails;' with the February issue, there loomed across our path the juggernaut, the power of the Atomic Age.

The chief thing that made AMERICAN FORESTS outstanding was the photographs that were often beautiful enough to be framed. Who wishes to have AMERICAN FORESTS, its interior and its cover a magazine of 'modern art'? Give us again rest from daily living in AMERICAN FORESTS!—*A. B. Fowler*, Altadena, California.

SIR: When I first subscribed to AMERICAN FORESTS, I did so with some reluctance . . . the magazine sold itself. In the February issue, Edna Ferber's article (My Favorite Tree) alone is worth the year's subscription.

I could do with less art. . . . No artist can touch the camera in a forest. —*Harold C. Wilson*, Hartford, Connecticut.

SIR: Just received the February issue and I like the general tone of it. It makes me want to read every article. It proves that forestry need not be dry and uninteresting. Hope you keep it up.—*George W. Kelly*, Denver, Colorado.

SIR: I enjoy reading AMERICAN FORESTS very much. It is so educational and brings the appreciation of the proper use of our forests home to each of us. I only wish that it had a wider circulation in order to reach more people who would read it with much thought. In fact, I lend my copies so much that I can never find them when I want to refer back to some past reading. I am now without the February issue and would like another copy.—*Helen R. Yates*, Roanoke, Virginia.

SIR: Some of the art titles in the February issue are very good—but what happened to "Forestry is Big Business in Austria"? — *John Clayton*, Washington, D. C.

Editorial

Mr. Stephens Speaks Out

E. SYDNEY STEPHENS, chairman of the Missouri Conservation Commission, did some pretty plain talking at the recent North American Wildlife Conference. Unlike those who rush into speech or print with old stuff reburnished, this aggressive and realistic official threw away the book of smug complacence and starry-eyed optimism and laid bare some unhealthy conditions in our wildlife conservation movement that those concerned with this valuable resource would do well to remedy.

What particularly disturbs Mr. Stephens is the weakness of state wildlife administration. Of the state agencies "which are supposed to perform the principal function of wildlife conservation in America," he said, 12 are less than 25 percent efficient and 30 rank below 50 percent; and only five have a passing grade of 60 percent or better. What seems to gall the Missouri official most is that the 12 states which rank less than 25 percent efficient collect from sportsmen and expend annually some $2,345,000.

"Since these states," he said, "are so pitifully deficient in the application of so many sound practices; since they are entirely devoid of educational and research activities; since they are dominated by politics, the money which they expend is wasted—and to the detriment of wildlife. They should be painlessly but promptly put to death. The next 18 might be given a stay of execution on their promise to reform."

Strong words—but to back them up the Missourian applied "a few simple and reasonable standards" to state wildlife administration: Adequate legal authority, employment of trained personnel, the development of wildlife environment, education, practical research, cooperation with land owners, and the support of citizen organizations.

"Judged by these standards, and on the basis of their own statements," he said, "twenty-five states are lacking adequate legal authority to administer wildlife resources or to regulate their use. Sixteen employ no trained technicians whatever, or are not better than 20 percent equipped or manned. Fourteen give no attention to the improvement or development of environment. Twenty-one carry on no cooperation with any group or individual. Fourteen make no effort in the field of education, and 20 others do not claim to be more than 50 percent efficient in that vital field; none is more than 70 percent efficient.

"Twenty-three, or practically one-half of the states, do not carry on research of any kind. Nineteen do not cooperate with any landowner or land use agency. Five states maintain no forestry departments or agencies and six have no cooperative forest fire prevention and control programs—all this despite the fact that forests are inextricably related to wildlife.

"The turnover in state directors is faster than a jet-propelled plane. Their average tenure in office is five years and twenty-five days. Only eight have been on the job as long as 10 years; 15 have served three years or less."

As a final touch to this disturbing indictment, Mr. Stephens believes, on the basis of his appraisal, that "while the federal and a few state agencies have accepted the fundamental concept that 'all land and all products of the land must be considered in building a balanced civilization,' and are attempting to practice and to project it, too many state agencies have not."

What is the answer to this situation? Mr. Stephens believes—and we believe with him—that the quickest road to any conservation objective is an informed public. The fundamental concept that "all land and all products of the land must be considered in building a balanced civilization" must be part and parcel of the basic thinking of all Americans. "Yet," says this outspoken Missourian, "despite the zealous and sometimes consecrated efforts of designated leaders from national and state organizations dedicated to the task of conservation, I know of no group which can claim to be even halfway successful in this respect."

If we accept this disturbing picture, and coming from such an authority there seems small reason to do otherwise, we must also accept the challenge that goes with it. Some way must be found, again to use Mr. Stephens' vigorous words, "to strike the spark of conservation" in the minds of citizens and to "rescue state wildlife administration from the lethal hand of partisan politics."

The greatest opportunity to achieve this, Mr. Stephens believes, lies in the lap of outdoor writers. That is, if they learn what conservation is, what it takes to fill creels and bags. "The trouble now is that 98 percent of the outdoor writers apparently don't know what it is all about," he said. "They either clip and paste, or write glowing accounts of what Joe Doakes killed or caught last weekend, which only invites and incites millions of others to go and do likewise. Never a word about what it takes to put fish in streams or birds in fields. Too often they preach the heresy of restocking of fields and streams and keep alive in the minds of hopeful and greedy nimrods and fake state departments the vain hope of more game from incubators and brooders, and they completely ignore Mother Nature, who can do a vastly better and bigger job.

"But if they learn what conservation is, they can do more right now than any other group or agency."

What Mr. Stephens is saying, of course, is that if the sportsmen who pay millions of dollars in license and other fees to the states are shown that their money is being dissipated by inefficiency and politics to the detriment of their wildlife resource, they may rightfully be expected to do something about it. And in this he is undoubtedly right. In fact, the raising of the standard of sportsmanship in this country would in itself be a major triumph in conservation. Exploitation and commercialization of game by so-called sportsmen is still rampant; and organized and well-heeled predators of special privilege are still with us.

But this is not the complete answer to the unsavory issues raised by Mr. Stephens. It might profitably be recognized that the American people as a whole have a much greater stake in our wildlife resource than any single-purpose group, such as sportsmen. What is needed is a greater awareness on the part of all the people as to the weaknesses in any part of the overall conservation structure — whether it be wildlife, forests, soil, or water. It is hard to believe that when fully informed they cannot, and will not, correct it.

"Woods Road in May"—photograph by Rutherford Platt

HOW TO USE DDT

By A. G. HALL

Dust or finely-atomized spray is distributed with new high-velocity blowers for use on roadside or open-grown trees

Properly applied, DDT can provide effective control of insects, especially the defoliators, on forest, shade and ornamental trees

"IN this jar we have a few chips of wood treated with a DDT solution," said the entomologist, holding up a one-quart preserve jar. "Now, I'll inject a few healthy house flies, and screw on the lid. We'll come back to this demonstration later on and note the effectiveness of the solution."

A few of the more skeptical in the audience stayed right with the demonstration to be sure that the "magicians" did not substitute another jar. The flies staggered around after coming in contact with the DDT-treated chips, performed some rather unfly-like gyrations, and finally succumbed to the death which now threatens a large number of insects dangerous to the health or economic position of man.

That demonstration took place at the U. S. Department of Agriculture's experiment station at Beltsville, Maryland, about three years ago. Since then, progress in the use of this chemical has made tremendous advances. From the killing of a few flies in a bottle, entomologists have moved on to the wholesale spraying of many thousands of acres of forest land, bringing death to millions of hemlock loopers, spruce budworms, gypsy moths and other insects which have long defied economic means of extirpation.

While much is yet to be learned of the effects of DDT, and newer developments and more thorough tests are in progress, sufficient knowledge has been gained to enable entomologists to recommend DDT's use for specific insect control purposes. In this article, the most up-to-date information is summarized for the guidance of persons who wish to utilize the new insecticide on shade, ornamental and forest trees, the field in which it shows the greatest promise.

Around two and three-quarter million pounds of DDT are manufactured each month, but this is not enough to meet the demands of forest and shade tree owners, farmers, orchardists, gardeners, housewives and others who look to this drug to solve all their insect problems. When it is realized, however, that for many uses DDT may comprise only one-tenth of a percent of the emulsion or solution applied in the battle against the bugs, the far-reaching effects of even so limited a supply become clear.

The chemist knows DDT as dichloro-diphenyl-trichloro-ethane, a substance which does not occur naturally, but which has been known for about 70 years. It is only slightly soluble in water, but it can be dissolved in various oils, in xylene and similar solvents. Thus it can be made into solutions or emulsions for sprays. DDT powders may be used for dusting, and if a wetting agent is used the powders may be mixed with water for use in sprays.

In commercial practice, DDT dusting powders are made by adding the pulverized DDT to fine-ground talcs, clays, sulfur, or other materials to produce the required strength. DDT may also be purchased as wettable powders, oil solutions, or as emulsion concentrates. A supply of a 25 or 30 percent emulsion concentrate will permit the home owner to make up almost any concentration he needs for a specific purpose, as it may be diluted. From a few teaspoonfuls to a half cup of such a high concentrate in a gallon of water will produce a DDT emulsion strong enough for any shade or ornamental tree application —and is perfectly safe to use.

In its powdered form, DDT is harmless to people and other warm-blooded animals unless taken internally. This is true also of emulsions and water suspensions, although some of the emulsifying agents used in preparing emulsions may act as irritants. Oil sprays should not be used on animals or living plants because these are absorbed by the surface tissues. If the hands or other parts of the body become wetted with oil solutions, they should be washed well with soap and warm water.

With insects, DDT causes death by its effects on nerve centers. It produces a paralysis which usually starts in the hind legs, progressing to a complete paralysis and finally to death in from a few minutes to several hours.

World War II gave DDT such favorable publicity and free advertising that the local hardware or drug store is finding it difficult to keep it

Flying at a height of from 50 to 100 feet above the tree tops, the plane sprays death to the hemlock loopers

Knapsack sprayers may be used on low plantations and individual trees for the control of sawflies, weevils, spittle bugs and many other insects

For higher trees, long-handled sprayer is often necessary to assure that foliage and bark are thoroughly wetted with DDT solution or emulsion

on the shelf. Preparations are being used, both wisely and unwisely, for the destruction of all sorts of household insects, including fleas on the dog and cat. When confined to the household, the results are purely local and few persons care what happens to the other fellow's dog or cat. But when the use of DDT moves outdoors, the question of upsetting the biological balances which exist in nature immediately arises.

For example, it is well known that even mild concentrations of DDT will kill off the ladybug beetles which feed on aphids and scale insects. Further, when it is realized that most insects are either helpful or at least of no known harm to man, one must proceed with caution except in places, like the home, where the elimination of all insect life may be desirable.

The problem faced by the entomologist and the experimenter with DDT is to prepare concentrations and methods of application which will be selective enough to deal a lethal blow only to the particular enemy against which it is aimed. And for most of us, the best caution that can be given is to leave the experimenting to federal and state agencies and to private industrial concerns. They know how to experiment. Use DDT only according to the advice of such agencies and reputable manufacturers. If one follows these simple rules, DDT can be used safely and effectively.

Entomologists and insecticide manufacturers recognize DDT as another insecticide, more powerful in some respects than certain of the others, but by no means *the* insecticide. There are other insect killers which over a long period of time have proved to be effective. These should not be replaced by DDT, just because of its popularity. For example, derris powder, containing rotenone, has long been used to rid house cats of lice. DDT will do the same thing, but since cats lick themselves and thus will consume DDT even in its powdered form, it will also rid the house of cats. On the other hand, DDT in powdered form can be used safely on dogs, but should not be used in oil solutions, since the DDT will be carried through the skin and may have serious effects on the dog itself.

A very convenient dispenser for DDT is provided in the aerosol "bomb," which was developed for use by the military forces during the war. The Army's most recent specifications for such bombs call for about three percent DDT and about two percent pyrethrum. The bomb is a light-

weight container of steel, usually about pint-sized, from which an aerosol or mist is discharged through a valve. The propellant is dichlorodifluoromethane, or "Freon-12" for short. At a temperature of 70 degrees this liquid changes to a gaseous state with great rapidity and expands to 260 times its liquid volume. The tiny particles, ranging from two to 12 microns in size, remain in the air for about 20 minutes. By combining pyrethrum and DDT, the bomb has a double effect against flies, mosquitoes and other insects in a room or, as the Army used it, in tents and foxholes. The pyrethrum knocks the insects down, and the DDT residue, left on everything with which the mist comes in contact, deals death to any late comers. The aerosol bombs are now available to the public. They are ideal for use by campers, and may be used also in the home and greenhouse.

About the use of DDT on shade and ornamental trees, there is much conflict of opinion among laymen. On the one hand, there are those who would ban DDT out-of-doors, except for its use by trained operators, because of the possible dangers to other forms of life. On the other hand, there are those who, visualizing mosquito- and gnat-free summer evenings on the lawn, gardens free of insect pests, and shade trees without a dangling caterpillar, would spray the whole neighborhood. Between these extremes lies the advice of the entomologists who with a word of caution, spell out what can be done by the average homeowner in reducing his local pest problems.

DDT in limited applications may be used to protect your shade and ornamental trees against most of the leaf-eating insects. The unsightly tent caterpillar is especially susceptible to DDT, as are most of the caterpillars. If the branches of the tree are sprayed with a one-tenth percent DDT emulsion a few days before the eggs begin to hatch, the tree should be safe from caterpillar attacks. Or the nests may be sprayed as they begin to form.

This same emulsion may be applied against locust leaf miner, boxwood leaf miner, cankerworms, gypsy moths, sawflies, elm leaf beetles, the catalpa sphinx, evergreen bagworm, mimosa webworms and other defoliators.

The female cankerworm crawls up the trunk of the tree to deposit her eggs and the gypsy moth caterpillars also crawl up and down the tree trunks between feeding periods. These and similar trunk climbers can be controlled by the simple expedient of spraying a broad band of DDT emulsion around the trunk, a few feet from the ground. All the insects which cross this lethal path are doomed.

Spraying may be done with the ordinary hand sprayers or by power sprayers, and the surfaces should be thoroughly wetted so that a residue of DDT remains after drying.

Leaf hoppers, tree hoppers and spittle bugs likewise may be controlled with DDT emulsions ranging from one-tenth to one-half percent.

At a recent meeting of the eastern branch of the American Association of Economic Entomologists, Stanley W. Bromley of the Bartlett Tree Research Laboratories, reported on the results of DDT in insect control on shade and ornamental trees. Said Mr. Bromley, "Whatever superiority DDT possesses lies in its remarkable and speedy control of great outbreaks of a few major insect pests such as cankerworm, gypsy moth and Jap beetle. It also promises to be very important in controlling the bark beetles which transmit the Dutch elm disease." He pointed out that DDT gave practically 100 percent cankerworm kill on a row of large American elms and pin oaks, but that lead arsenate eventually produced as good control, though more slowly. And the DDT spray also killed the cankerworm's parasite.

"Some of the shade and ornamental pests which were not controlled or even were fostered by DDT included various species of red spiders, certain sawfly larvae and certain sucking insects, a small yellow aphis and the filbert lacebug," said Mr. Bromley. "On arbor vitae, DDT was followed by a resurgence of red mite which completely browned the leaves in a month. On a honey locust, red spider developed on DDT-sprayed portions to the extent that the leaves yellowed and dropped.

"A severe oak lacebug infestation developed on a large swamp white oak which a month previously had been in the path of a helicopter application of DDT. A Jap beetle infestation in the area had been pretty well cleaned up by the DDT."

Thus it can be seen that DDT is not an unmixed blessing.

In reporting on the use of DDT in the control of lygus bugs on beet seed plants, the Geigy Company, Inc., the American office of J. R. Geigy of Basle, Switzerland, the dyestuff house which originated the DDT insecticide, states that the bugs were virtually eliminated in an area where the average population before DDT dusting was as high as 19 bugs a swoop of an insect net. The report states further: "With regard to the effect of DDT on beneficial insects — it was noted that ladybugs and syrphid flies were among the first insects to be killed. Honey bees did not seem to be affected. It appears also that the larvae of lady beetles which hatched

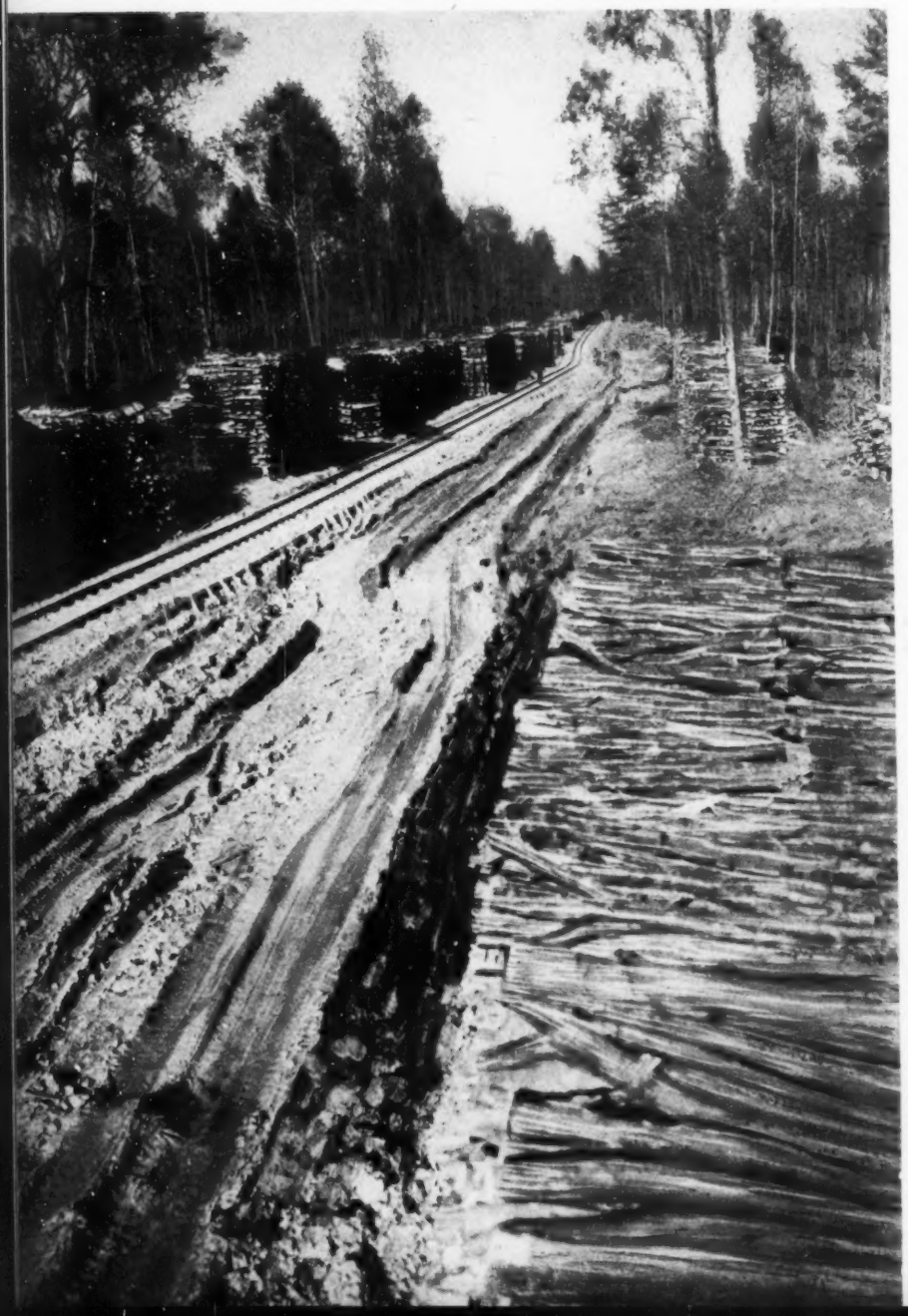
(*Turn to page* 186)

Ideal for use by campers, aerosol bomb, shown being demonstrated at National Sportsman's Show, sprays a fine mist of pyrethrum and DDT

The story of a vital but little known woodcutting mission that won the plaudits of the French

WOODPILE

By B. B. BENTON



FROM the time American troops swarmed ashore in Normandy in 1944 until the redeployment crisis passed early this year, a little known but extremely important forest mission was performed by the Chief Quartermaster ETO. The job was to procure fuelwood for the American Army fighting in France and, after VE-Day, quartered there for redeployment—and to do so without violating forestry practices established by the French National Forest Service.

Anyone with a knowledge of French forestry will quickly appreciate the magnitude of this mission. France is an ultra conservative country, with a long tradition in forest management, and the prospect of having its forests, drained by Nazi occupation and heavily obligated to postwar reconstruction of its war-shattered cities, ruthlessly slashed to warm hundreds of thousands of liberating troops, as well as a mounting legion of war prisoners, must have been of great concern to its forestry officials.

The request was therefore made that this gigantic woodcutting operation be carried out in accordance with established French forestry practices. This was agreed to by the American High Command, and the 533 QM Group, Colonel C. Elford Smith commanding, was given the task by Major General Robert M. Littlejohn, Chief Quartermaster ETO. The actual wood cutting operation was entrusted to Colonel Axel H. Oxholm, Norwegian born American for-

In spite of mud and high water this Army-built railway in the Argonne made possible the cutting of 110,000 cords

ester, who for more than a quarter-century has been closely identified with wood utilization in the United States.

It is now a matter of military history that the 533rd kept the GI's woodpile well stocked. Altogether more than 300 thousand cords of fuelwood were taken from the French forests. This equaled in heating value about 200 thousand tons of coal, and most of it was supplied at a time when coal either from French mines or from imported sources was unavailable for heating purposes. In addition, the operation cut and turned over to the French enough mine props to produce three million tons of coal, and produced hundreds of thousands of construction poles for depot installations and around 175 miles of woven wood matting for the Army's mud control program. As a final contribution, many thousands of bundles of branches and twigs—logging slash that would have been burned or left in the woods in this country—were turned over to French civilian authorities for the needy.

The 533rd performed this amazing job in little over 10 months, utilizing 10,000 war prisoners, German and Austrian. And it was done without damage to the fine stands of French timber—an achievement that has won for the Group the commendation of the French Government.

As a matter of fact, cutting areas in which the 533rd operated, especially in the Argonne, scene of the famous World War I battle which cost the lives of some 300 thousand men, and the Ardennes where the bitter Battle of the Bulge was fought at the end of 1944, were conceded by French foresters to have been left in better condition from a forestry point of view than when woodcutting operations started. Considering that the cutting was done by unwilling labor—prisoners of war, many until after VE-Day fresh out of battle—this achievement takes on added significance.

"Much of our success," said Colonel Oxholm, now in this country, "was due to the wonderful cooperation of the French Forest Service. Another factor was that among our prisoners were many German and Austrian foresters. These men took professional pride in doing a good job. Indeed, it was not uncommon to see one or more of them in spirited argument with French foresters over the relative merits of French and German or Austrian forest practices. In addition, every one of the POW's was carefully selected for the job."

What Colonel Oxholm, who served as director of the National Committee on Wood Utilization and director of the Forest Products Division, Department of Commerce from 1916 to 1935, and who before the war was managing director of the Pacific Forest Industries, Tacoma, Washington, failed to emphasize was that his own "untiring energy, resourcefulness and imagination," to use the words of the 533rd's commanding officer, "in training and handling 10,000 prisoners of war used in this operation was little short of miraculous . . . one of the outstanding jobs of this war."

Colonel Oxholm moved into France shortly after the invasion, establishing his first operation of any importance in the Cerisy Forest west of Bayeux. Initial efforts were disappointing. First, an attempt to salvage poles sunk in the ground to prevent glider landings—Rommel's asparagus, the troops called them—had to be abandoned when an unusually large number were found to be mined.

In September, a number of camps were established in southern Normandy, with some 500 to 1,000 prisoners assigned to each. Shortly thereafter, additional camps were operating in the Loire Valley and southeast of Paris. Then about the time the Nazis were attempting to drive through the Ardennes, an operation was begun in Brittany, utilizing part of the enormous contingent of prisoners taken at Brest. When the Nazis were thrust back to the Rhine, the 533rd moved into eastern France to begin its major operation in the Argonne Forest and the still smoking forests of the Ardennes.

"The Argonne prior to the advent of our woodcutters was a logger's nightmare," Colonel Oxholm stated. "The forest, untouched by battle in this war, was criss-crossed by deep trenches, ravines, ridges, dugouts and underground galleries two to three stories deep. The entire area was covered by dense young forest, thorns, interlocking brush—every obstacle imaginable. Available drinking water was so limited that it became a major problem in establishing a sizable logging camp. French loggers look upon the area as a forbidden plateau to be shunned. Its great historic interest, of course, may have something to do with this. More than 300 thousand soldiers lost their lives in the Argonne during the last war, and skeletons, unexploded shells and all kinds of war equipment are still found in abundance throughout the forest.

"From a fuelwood point of view, however, there was no better timber in all France. The chief difficulty was that the gigantic snags and shell-damaged oaks still standing proved to be ruinous to saws and axes."

The Ardennes forest suffered relatively little damage as a result of the Battle of the Bulge, Colonel Oxholm said, but was pretty hard hit when the Nazis broke into France in 1940. Furthermore, during the period of occupation, the Germans removed considerable timber and fuelwood from the area.

Briefly reviewing the overall op-

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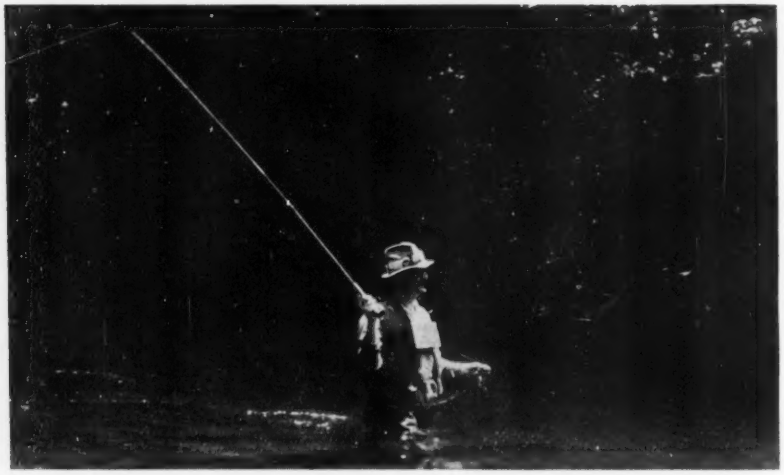

Technique for dry fly casting—the line is brought to the rear

Then when it is straightened out behind, a smart forward motion

And bingo—the fly settles lightly on the water to tempt Mr. Trout

There is no finer sport than dry fly fishing — when you know how. Here an expert shares some of his secrets

ANYONE who has fished for trout with dry flies knows that there is no finer sport on earth. The thrill of seeing a graceful, swift and vigorous game fish strike a lure in clear water has attracted many to the dry fly clan; sheer sportsmanship keeps them there. For in dry fly fishing with light sporting tackle, the odds do not always favor the angler.

Because it is a fine art, fly fishing is not always fruitful for the uninitiated. Until they have mastered basic techniques their efforts may well be rewarded with empty creels. However, once they have the know-how, the chances are that they will become zealous missionaries to the dry fly cause.

The writer has been such a missionary for years. From Alaska's glacial rivers to Georgia's picturesque mountain streams he has found thrills whenever a speckled beauty rose to his feathered offerings — especially when the lure was a fly he had designed and made himself. He is therefore passing along to the novice some of the techniques and observations that spell satisfying creels when dry flies and light tackle are employed, so that they, too, may know the fascination of this king of all angling sports.

First, it is well to know something about your quarry — the fighting trout. The most consistent riser to dry flies is the native brook trout, "old square-tail" to fly fishermen. His fight, his strong surges of power and his leader-breaking tricks make him a worthy foe. As a rule, you'll find him on the edge of swift water or deep in cold lakes.

King of the white water is the rainbow trout, and his various blood-brothers and sub-species. A spectacular jumper, he is much heavier than the brookie. His weight when hooked in the heart of a boiling current is a

FINE ART OF *Fly Fishing*

By DON CARPENTER

distinct advantage over the fisherman's light tackle. He frequently snaps the leader or throws the fly on his first jump.

The majority of big rainbows are caught on comparatively heavy leaders and wet flies, and few are successful in taking these weighty fish on gut that tests less than a pound, which is commonly used for brook trout. Indeed, the writer has observed that the rainbow will take a wet fly tied on a gut testing far in excess of the weight of the fish when the lure is presented in fast water. This leads him to believe that the rainbow is not as choosey as the brookie. However, in still water the rainbow is very temperamental about dry flies presented on extra heavy leaders, though small to medium fish are not difficult to take in the average stream.

Combining many of the best qualities of both the brook and rainbow, the brown trout is the most unpredictable. He is taken on both wet and dry flies, but is not easily lured, except at infrequent intervals when he will hit almost anything. To lure him into striking requires more than the usual ability and skill; and he is difficult to land. Able to withstand higher water temperatures than any other trout, the brown has become acclimated to all kinds of water. He attains a weight second only to the rainbow, due to his cannibalistic tendencies and voracious appetite. The brownie's fight includes jumps, sulks and canny skill in breaking away. This makes the capture of an old timer a feather in any angler's cap, especially if a dry fly is used.

To more realistically illustrate modern dry fly fishing technique, let's visit a typical mountain stream where brook, brown, or rainbow trout, or perhaps all three, may be found, as is the case in some eastern waters. Assuming the fish to be of average size, and your tackle complete and proper, the selection of good water to try your luck is your first thought. Just ahead lies a pool shaded with alders. A medium current flows in midstream, flanked with ribbons of quiet water. Dark inviting recesses under the overhanging branches give the thigh-deep water an aura of unlimited

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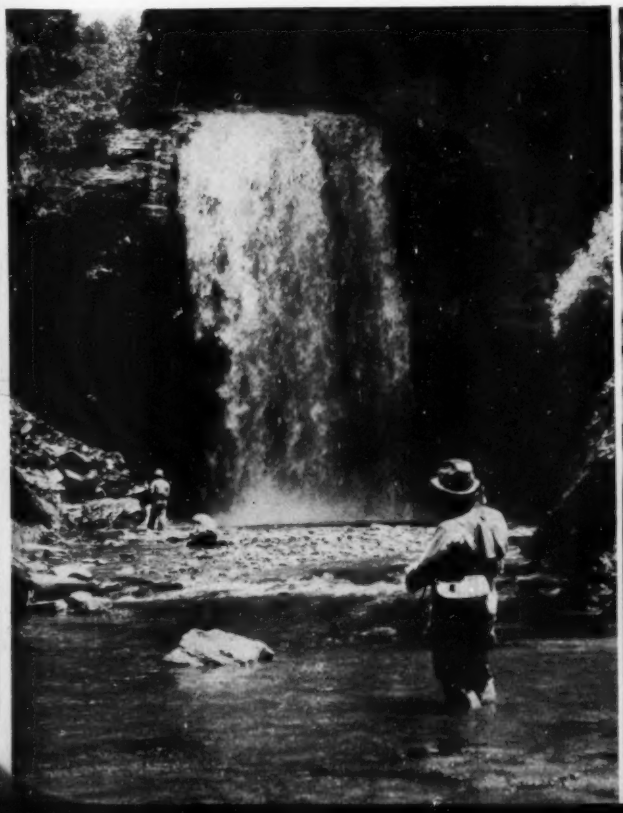
A likely place to cast for the wily brook trout



The well equipped angler keeps his flybox handy

Mayor Richard Sweeney of Hagerstown plants the first tree, aided by the author and a 4-H boy

A MEMORIAL FOREST IS BORN

By HARRY W. and DENDRIC J. DENGLER

THE newspapers predicted scattered showers. Everyone, though prepared for the worst, hoped that the weather reports were in error. Spring was well advanced; the memorial seedlings had already laid a week in the University of Maryland's cooling lockers to check their growth. Another week might be too late.

Over South Mountain and down into Bull Tail Hollow, the trees were dripping with moisture. Across Warner Hollow, Buzzard's Knob hung shrouded in low-lying, misty clouds. A lonely Fairchild F-24 plane probed through the sodden sky. Truly, this was no day to establish Maryland's first memorial forest.

Up the road from George Scholl's mountain cabin, a dripping "Memorial Forest" sign pointing to the left; a carload of happy, husky farm youngsters were parked beneath it. On the mountainside, James Jordan of the Washington County soil conservation district and a helper from the Civilian Public Service Corps were unloading tools. So far, not enough rain had fallen to make the soil too wet for successful tree planting.

Soon the sound of trucks, cars and school buses came up the mountainside. The officials gathered for a brief, worried consultation. Then, suddenly, the sun burst gloriously through the clouds and mist. The contrasting effect was startling. Everyone agreed to start.

Quick and willing hands prepared the rostrum for the ceremony. A contour furrow for the platform, an American flag on the right, the green and white flag of the 4-H Club on the left, dogwood-flecked, beclouded Buzzard's Knob for the backdrop.

Down the hollow a youthful bugler, obviously out of both breath and practice, sounded assembly; but somehow, in this sylvan setting, no one seemed to notice the imperfections. Quickly, silently and solemnly the group gathered by the flags. The simple ceremony establishing a memorial forest for Maryland had begun.

The simple but impressive ceremony establishing this memorial forest, as well as its purpose and background, may serve as a guide to other cities

The story behind this memorial forest starts back in 1939 when Chemist Richard C. Willson and Chairman J. Garvin Hager, Jr., of Hagerstown's Board of Water Commissioners, became alarmed at the rapid rate at which their Edgemont and Smithsburg reservoirs were becoming filled with silt. Several years previous one of these reservoirs, less than a half acre in size, had yielded, when cleaned, 22,000 cubic feet of soil, or a little less than 1,000 tons—a total loss to nearby farmers and an expense to Hagerstown's taxpayers.

The board called upon the U. S. Soil Conservation Service and the Maryland Department of State Forests and Parks for assistance. A careful study indicated that only 40 acres of cultivated land were the chief offenders. Hagerstown's mayor and the Board of Water Commissioners acted promptly. With the help of the local soil conservation district and the National Youth Administration, these offending 40 acres were quickly reforested.

Late last year evidence that the City of Hagerstown is about ready to cash in on this investment appeared in its city hall. On a gaily decorated, seven-foot white pine tree placed in the lobby appeared this inscription: "This tree was grown by your Water Department." Citizens, intent on paying their taxes, at first were puzzled. Then the newspapers told them the story: "This tree," it was reported, "is one of 48,000 raised from seedlings and planted in 1940, primarily to forestall soil erosion on the Edgemont reservoir watershed. When planted, the seedlings were but a few inches high; yet in six years they have grown to a size ideal for the Christmas tree market. Because they are too dense on the watershed, it will be necessary to thin them out next year, and it is estimated that several thousand will be available for sale to local dealers. As the older trees are removed, other seedlings will be planted, keeping a steady supply at Christmas time."

Estimates indicate that had Hagerstown desired to cash

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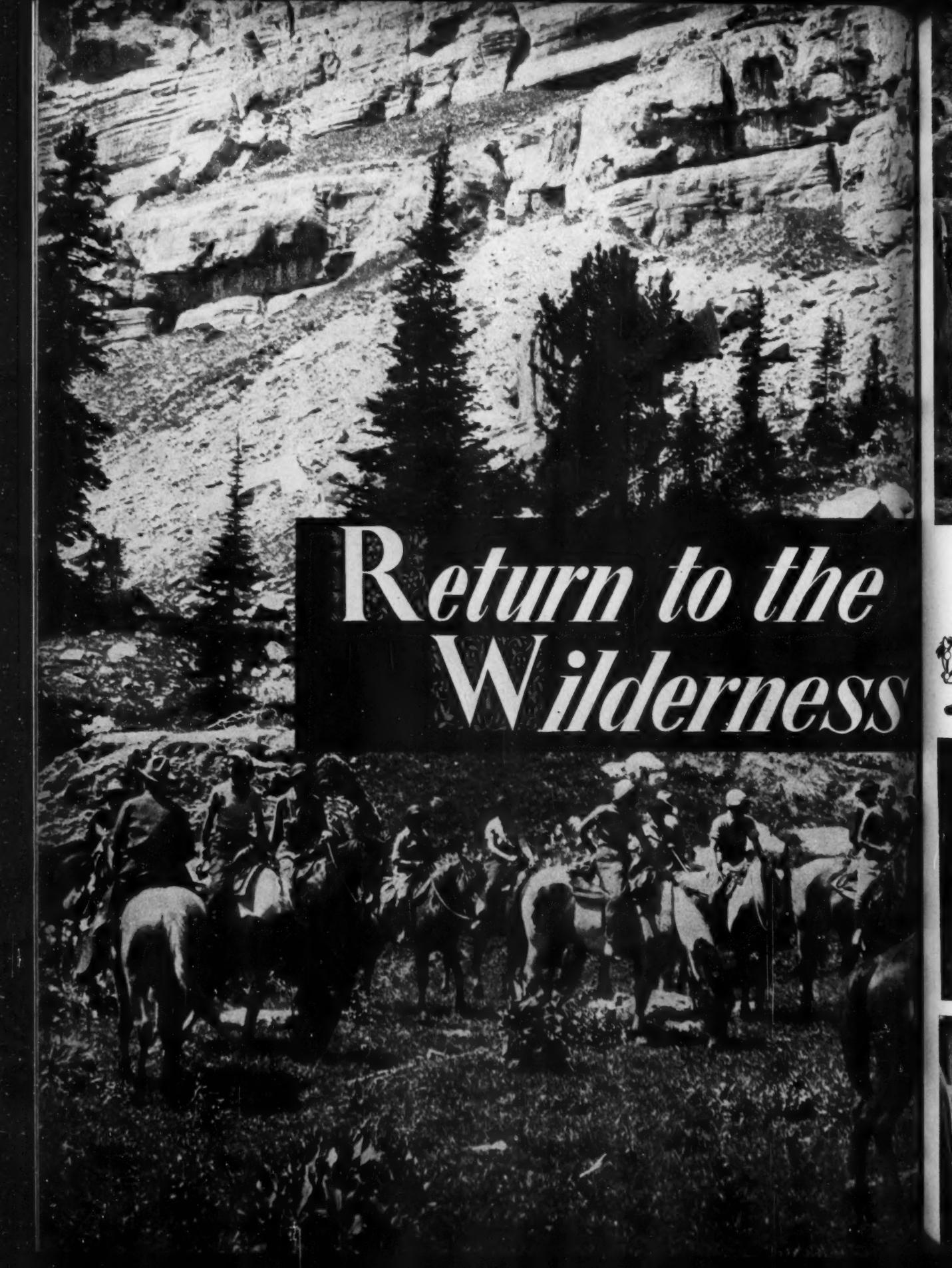
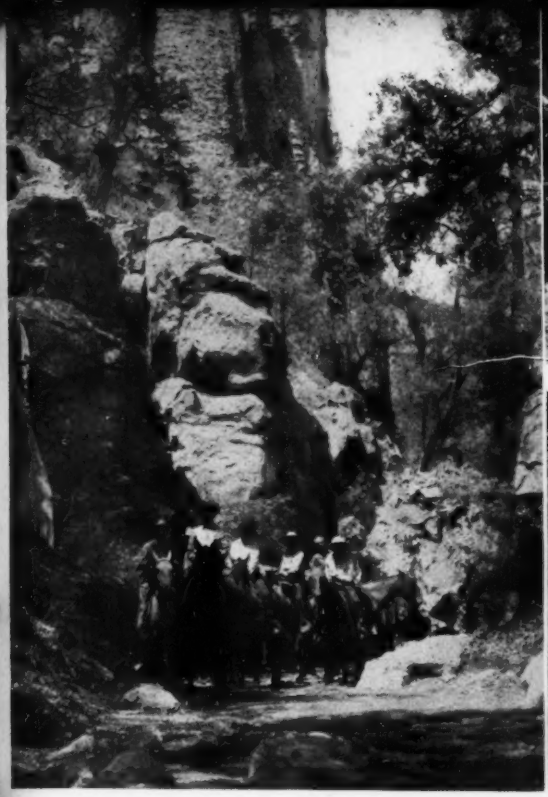
Above—memorial seeds being readied for flight. Below—4-H members start their forest planting


Return to the
Wilderness



One of the fruits of Victory will be the return this summer of the Trail Riders of the Wilderness to the wild, rugged back country—the priceless remnants of the magnificent wilderness that was once America—of our national forests and parks. Discontinued because of the war, these organized pack trips, sponsored by The American Forestry Association as one of its educational services, will be resumed early in July when the first of six expeditions planned for the summer rides into the Flathead-Sun River Wilderness of Montana. A second party will explore the same area in late July. Two parties will go to Colorado, the first in mid-July to the Flat Tops Wilderness, the second in early August to the Maroon Bells area. In mid-August and early September parties will ride into the California Sierra. To join one of these parties, write The American Forestry Association.

Arctic Muskrat

By JAY ELLIS RANSOM

THE rain drizzles coldly on my California windowpane, while far above, where the Sierra meets the murk-filled skies, wind and snow battle on the timberline. My thoughts drift away to another spring, not so long ago, but thousands of miles away, when I lived along the Arctic Circle, on the central Yukon River of Alaska.

I can visualize, as clearly as if in a dream, my cabin standing at one end of a small Indian village on the high bank of a slough. Beyond the broad bareness of a sandbar flowed the river's sluggish, muddy waters, roiled and swollen by spring floods, bearing unspeakable burdens of flotsam.

A short distance above the Yukon was 20 miles wide, choked with islands interspersed by sloughs and waterways; below me, the flats converged toward a canyon in a low range of mountains. Here the great stream flowed swifter, deeper, and was less than a mile across.

It was my privilege to live for two years in the muskeg forest wilderness, in the heart of muskrat land. It was also the land of giant moose, of the shadowy caribou, of the red and silver fox. It was the land of the lynx, stealing frozen rabbits from Indian-set snares; the land of mink, marten and bear, ermine, sable and beaver. But above all, it was the land of muskrat, bread and butter for the Indians, wealth and poverty for the white man, depending on the price of furs in the distant Seattle market.

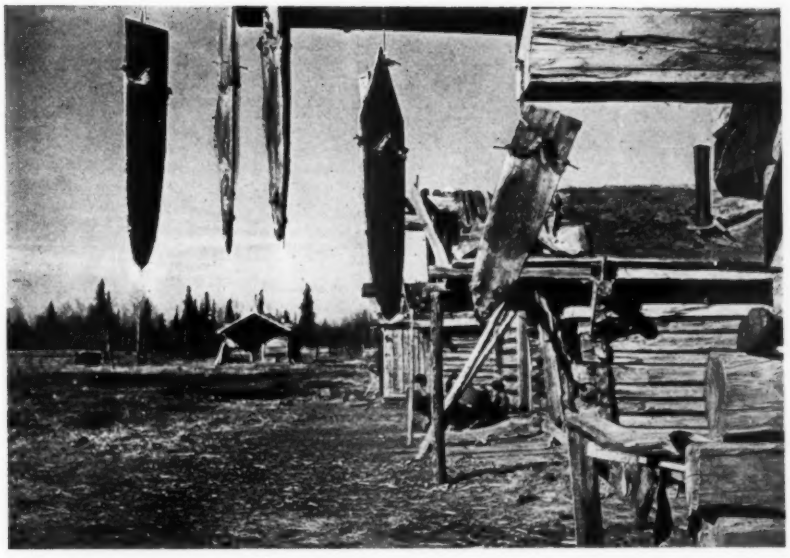
I have seen the muskrat houses on the frozen Arctic lakes—black domes of mud and branches raised above breathing holes in the four-foot thick ice. I have watched muskrats swimming in the calm spring midnights, when day splashes its sempiternal colors around the clock, and the ice has vanished under the long sun.

The strangest thing about it all is its dreamlike quality. Here in the southern California hills I can hardly believe that a portion of my life was part and parcel of that ancient land; that I ate muskrat with relish, and caribou flesh with delight. I show my color slides to Kiwanis and Rotary, and it is as if I were lecturing about someone else. Yet I was there, taking those photographs, tramping the sodden muskegs, hunting ducks along sun-warmed tarns in the purple light of the midnight sun.

From early March until the last day of May, "ratting" is in full swing. During the first weeks of the season the muskrats are trapped under ice, since the hand of winter still lies heavy on the land. It is not until late April, and through the whole month of May, that mass hunting gets into full swing. Then the hunters, armed with rifles, cruise along the silent waters of countless lakes,

Muskrat waters provide livelihood of man and beast in the Arctic bush

Muskrat carcasses, food for dogs



Stretched and hung up to dry, the skins are now ready for the market

picking off the swimming rodents. Hunting is done at night, if one can call it that, with the sun well above the far northern horizon.

During these days, every man, woman and child old enough to place a trap or shoot a rifle thinks muskrats, talks muskrats, and hunts muskrats. From every lakeside camp the strong odor of stewing muskrats wafts on the light spring winds. Every village cabin is heavy with musk and the odors peculiar to thousands of dead rodents dangling without their skins from smokehouse rafters, drying in the sun for use later on as winter dog feed.

Trapping muskrats under ice is far more difficult than shooting them. Their skins, however, being "unventilated," bring the highest prices.

Profitable trapping requires daytime temperatures above freezing. It may occasionally happen that in the early, cold part of the season a trapper breaks into a muskrat house to set his trap in the water under the breather hole. Unless skilfully done, and the naturally insulated house rebuilt over the hole, night temperatures of minus 40 degrees will freeze up the hole. Then the trapper either loses a good trap, with attached muskrat, or he must laboriously chop both out of solid ice, destroying the whole house in the process. With the domed house gone, and the hole frozen again, the entire muskrat clan will drown from a lack of air under the ice. Like the beaver, the muskrat builds his house above the water level of the lakes, lines it warmly with grass, and constructs long tunnels from the house to the shore. These are his runways and permit him access to feed. Destroy these, or admit water to flood his runways, and Mr. Muskrat will join his ancestors in short order.

About the middle of May the whole northland undergoes the greatest change of the year—the breakup of the ice. For nearly a month the last vestiges of snow have been gone, and overflow waters have been creeping out from under the river and lake ice to flood the shorelines. At this time the Indians, who have been gradually bringing in their traps for summer storage, ready their canvas canoes for mass hunting. The lake ice, not being disrupted by spring floods such as occur on the Yukon, unless the latter floods over the entire region, slowly rots out, growing mushy and soft on top, breaking loose from the shores, until it eventually disappears altogether.

All around the shallow shores, warmed in the constant sunshine, the rich, black soil sends out new bright green shoots of grass and water rushes. Muskrats swim in the dappled waters or burrow in the sedges left by the retreating winter snow. Overhead uncounted flocks of ducks wing their rushing way northward to their Arctic breeding grounds. High wedges of geese honk their slow way through the vaulted skies, blackly etched against the northern sun.

The widely opening lakes are not less silent than the dark shadows of Indian canoes drifting, waiting for Mr. Muskrat to show his sleek, black head. A sharp *ping* from a .22, and the unfortunate muskrat is just a corpse, soon to be another skin on the trader's counter and a drying, odoriferous body hung on a smokehouse rafter.

In World War I huge fortunes, by native standards, were made in muskrats, the skins of which reached the phenomenal price of $5.40 apiece. When I lived there, early in World War II, the price had not risen above

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A picture of the dark Yukon tarns where trappers and hunters match their wits against this fur-bearer

Hawkeye Woodlots

By J. A. DONERY

This article previews the findings in Iowa of the Forest Resource Appraisal of The American Forestry Association. Georgia and New Jersey will be presented in the May issue.

IOWA is one of the country's leading agricultural states and its fame has spread far and wide. Eastern school children have long been taught that Iowa corn and hogs are pre-eminent in quantity and quality. Iowans are known to be thrifty. Californians sometimes claim that Los Angeles is chiefly populated by retired farmers from the Hawkeye State. Early in the present century, many Iowans invested in northwestern timber claims; so many, in fact, that out in Washington and Oregon, absentee timberland owners are still referred to as "Iowa school teachers."

In Iowa, forestry is recognized as an agricultural pursuit —has long been regarded as having economic significance. As early as 1865, cottonwood planting was started on a considerable scale. Yet, for many years prior to the war, the actual practice of forestry was sadly neglected.

The state's original forest area has been estimated by various individuals; probably the most authentic figure is that obtained in 1939 by Charles M. Genaux, of Iowa State College, and John G. Kuenzel, of the Central States Forest Experiment Station, who reported that approximately 6,680,000 acres, or 18 percent of the total land area, was forested when white settlement began. Present forest area is estimated at 2,248,000 acres, or 6.3 percent of all land.

More than 4,432,000 acres actually have been cleared; the present woodland acreage includes lands which have been planted, as well as those which once supported grass but now are covered with volunteer forest growth.

At the beginning of 1945, the 2,248,000 acres of forest land supported approximately 5,480,000,000 board feet of sawtimber, 7,000,000 cords of wood in trees below sawtimber size, and 12,000,000 cords of material in cull trees and in tops and limbs of all trees.

For many years, prior to 1910, Iowa sawmills produced large quantities of lumber, chiefly pine from river-driven logs cut in Wisconsin and Minnesota. Production of lumber from native timber never has been of importance in the national picture, although considerable quantities of railroad crossties, mine timbers, fence posts and cordwood, as well as some boards and dimension, have been produced for local consumption. For 1942, the Bureau of Census reported a cut of 56,081,000 board feet of lumber from 824 active

Large white oak "wolf tree" cut in heavily grazed pasture in Storey County, makes a good log

mills. Yet only seven of these mills cut more than a million feet, and none cut as much as two million.

Harvesting practices vary from county to county, even farm to farm, according to the need of owners, or their plans for future use of lands now timbered. Demand for crop land and for pasture, in the past, has induced landowners to clear areas which might better have been kept producing trees, rather than farm crops, since in many cases erosion has been disastrous. To some extent this trend continues.

Many farm woodlots have been retained by their owners for timber production only. Probably a larger number of farmers utilize their timbered lands to supplement open pastures. The contrast between ungrazed and grazed woodlands is quite evident to all who care to look. In the latter case, considerable harm has been done through trampling and browsing; undergrowth of desirable species has disappeared, leaving large areas of mature trees under which grass sod has become too firmly established to permit restocking. And, naturally, when the mature trees are removed, the areas are no longer forest at all.

While partial cutting of timber has been practiced for many years to meet individual owners' needs—and many woodlots have thus been kept in continuous production—growth has not been as great as it might have been under more skillful management. Lately, farm foresters employed by state and federal agencies have induced many woodlot owners to adopt selection cutting methods when disposing of timber to commercial buyers.

The benefits to the timber owner and the buyer, as well, are so apparent that increases in such methods of cutting upon farm woodlands can be expected in localities where demonstration areas have been established. Yet probably three-fourths of all woodlands are still treated in the old haphazard manner.

In localities adjacent to mining centers, the pressure for mine timbers tends to induce owners to cut small trees and thus sacrifice much potential growth and profit. Most stands of sawtimber size are clear-cut in such places. Similarly, wherever sawmill owners can still buy timber for lump sums, they are likely to clear-cut, down to very small sizes. There is no more promising field for education than among such woodland owners in Iowa.

Ninety percent of Iowa's surface is farm land. Of the remainder, 6.3 percent is forest, and 98 percent of the forest is owned by farmers. The state owns 1.2 percent, while all other public and private holders account for less than one percent. Almost all of the forest is available for commercial timber growing, providing owners can be convinced it is worthwhile.

The forested lands are located mostly in the eastern half of the state, along the principal rivers and their tributaries, draining towards the Mississippi. About 30 percent of the forested area is classified as bottomland, and here is found about 40 percent of the sawtimber and cordwood. Oak-hickory and other upland types are found chiefly on rougher and steeper lands unsuitable for cultivation.

Timber in the southwestern part of the state is red and white oak, with small admixtures of lowland species. Northwestern and central portions are chiefly open prairies, adapted to farming.

Before field work of the Forest Resource Appraisal was undertaken in Iowa, a meeting was arranged with G. B. MacDonald, state forester, and Leonard I. Barrett, director of the Central States Forest Experiment Station. Matters of timber types, condition classes, units of measure and forms to be used in reporting results, were agreed upon at this conference to assure uniformity in procedure and accuracy. This was necessary inasmuch as the work was to be participated in by men from several agencies. Three types were set up—"Oak-Hickory Type," "Bottomland Type" and "Other Upland Type."

Condition classes of forest land as shown by the character of the growth were designated as "sawtimber areas," "pole timber areas," "seedling and sapling areas" (at least 40 percent stocked) and "poorly stocked seedling and sapling areas." Sawtimber areas included those which supported 1,000 board feet or more of volume an acre, International Rule, in trees 11 inches DBH and over; pole timber areas included all such with two or more standards cords of unpeeled wood an acre in trees from five inches to ten inches DBH, inclusive; and seedling and sapling areas included

Short, scrubby red and white oak are coming in upon these slopes bordering the lowlands along the Mississippi River in Fremont County

TABLE 1. FOREST COVER IN ACRES

January, 1945

Forest Type	Sawtimber Areas	Pole Timber Areas	Seedling and Sapling Areas 40% Stocked	Poorly Stocked Seedling and Sapling Areas	Total
Oak-Hickory	438,000	213,000	159,000	135,000	945,000
Bottomland	374,000	138,000	81,000	67,000	660,000
Other Upland	315,000	115,000	130,000	83,000	643,000
Total	1,127,000	466,000	370,000	285,000	2,248,000
Percent	50.1	20.7	16.5	12.7	100.0

TABLE 2. VOLUME OF SAWTIMBER

In Thousands of Board Feet International Rule
January, 1945

Forest Type	Sawtimber Areas	Pole Timber Areas	Seedling and Sapling Areas 40% Stocked	Poorly Stocked Seedling and Sapling Areas	Total
Oak-Hickory	1,586,200	95,400	69,200	48,900	1,799,700
Bottomland	2,026,000	108,700	28,600	16,700	2,180,000
Other Upland	1,380,460	40,430	55,860	23,550	1,500,300
Total	4,992,660	244,530	153,660	89,150	5,480,000
Board Feet Per Acre	4,430	525	415	312	2,438

TABLE 3. VOLUME OF CORDWOOD MATERIAL

In Cords of Unpeeled Wood
January, 1945

Forest Type	Sawtimber Areas	Pole Timber Areas	All Seedling and Sapling Areas	Material in Cull Trees Tops and Limbs	Total
Oak-Hickory	1,288,874	594,687	240,278	3,880,000	6,003,839
Bottomland	2,114,584	608,573	236,908	4,620,000	7,580,065
Other Upland	1,319,613	375,463	499,177	3,215,000	5,409,253
Total	4,723,071	1,578,723	976,363	11,715,000	18,993,157
Per Acre	4.2	3.4	1.5	5.2	8.4

TABLE 4. ESTIMATED ANNUAL GROWTH

Sawtimber in Thousands of Board Feet
For 1945

Forest Type	Sawtimber Areas	Pole Timber Areas	Seedling and Sapling Areas 40% Stocked	Poorly Stocked Seedling and Sapling Areas	Total
Oak-Hickory	66,172	11,135	5,113	2,517	84,937
Bottomland	128,781	18,353	4,872	1,468	153,474
Other Upland	52,921	4,531	1,500	2,281	61,233
Total	247,874	34,019	11,485	6,266	299,644
Per Acre	0.220	0.075	0.031	0.022	0.133

TABLE 5. ESTIMATED ANNUAL GROWTH

Material in Small Trees in Cords
For 1945

Forest Type	Sawtimber Areas	Pole Timber Areas	Seedling and Sapling Areas 40% Stocked	Poorly Stocked Seedling and Sapling Areas	Total
Oak-Hickory	127,763	39,612	15,615	1,670	184,660
Bottomland	342,358	124,895	50,112	2,564	519,929
Other Upland	81,961	26,557	63,938	1,462	173,918
Total	552,082	191,064	129,665	5,696	878,507
Per Acre	0.49	0.41	0.35	0.02	0.39

all others which were not classed as sawtimber or pole areas. Very little of the original forest growth remains and all forested areas have been classed as second-growth.

The acreage of forest cover by types, the volumes of sawtimber and cordwood material, and the estimated annual growth of both sawtimber and cordwood are shown for the entire state in the tables on this page. These data are presented together as a matter of convenience and layout. The stories they tell are discussed separately.

Approximately half of the forest area bears trees large enough to be classed as sawtimber. Two-thirds of the remainder is well stocked, but with smaller trees, while one-eighth of the whole is poorly stocked. All but 42,000 acres of this forest is privately-owned and all but 24,000 acres is available for commercial use; in fact, one might go so far as to state that practically all of Iowa's timber is in farm woodlots.

By species, the sawtimber is estimated as: Cottonwood, 1,500,000,000 board feet; red oaks, 1,200,000,000 board feet; white oaks, 750,000,000 feet; elms, 850,000,000; basswood, 150,000,000; maple and birch, 530,000,000; sycamore and hackberry, 40,000,000; walnut, ash and cherry, 360,000,000; miscellaneous other hardwoods, 75,000,000; white pine, 5,000,000; other softwoods, 20,000,000.

Yearly growth in trees of sawtimber size is believed to be producing 299,644,000 board feet, while growth of smaller trees adds 878,507 cords each year. These figures are especially interesting when compared with estimates of current drain. For it becomes apparent that, in Iowa, annual growth exceeds in volume the wood destroyed or taken away!

While practically none of Iowa's forested land can be classed as supporting old growth or virgin timber, there still remains well over a million acres which supports an average of 4,430 board feet an acre of sawtimber. This indicates that many timberland owners realize the importance of maintaining their lands in a productive condition even though the demand for local timber is heavy. During the war period, the cut of timber for the production of lumber increased materially—thus, in spite of the decrease in available labor. According to reports of the Bureau of the Census for the years 1939 to 1942, inclusive, and unofficial reports for 1943, 1944 and 1945, the lumber cut in 1939 was 5,164,000 board feet; in 1940, 9,971,000; and in 1941, 32,544,000 feet. In 1942, the cut was 56,081,000 board feet; in 1943, 56,810,000; in 1944, 57,128,000; and in 1945, it jumped to 74,060,000.

In addition to the sawtimber cut for the production of lumber, railroad ties, etc., during this period, an estimated 14 million board feet of basswood, elm and walnut logs were shipped out of the state for manufacture. The local consumption of fuelwood, fence posts and mine timber has made additional heavy drains on the timber supply, the amount cut from small trees (five to ten inches, DBH) having been estimated at 400,000 cords a year, or 2,800,000 cords for the seven-year period. It has been estimated that approximately 450,000 cords of fuelwood have been salvaged annually from cull trees and from the tops and limbs of all trees cut for commercial purposes.

Experts of the Central States Forest Experiment Station of the U. S. Forest Service, believe that average annual drain from natural causes (fire, insects, diseases, wind, etc.) amounts to 10,244,000 board feet in sawtimber and 19,520 cords of pole-size or cordwood material. They estimate the total drain from all causes, including commercial cutting, during the seven-year period ending December 31, 1944, to have been approximately 378,000,000 board feet of sawtimber, and 4,000,000 cords of wood from small trees, or an average of approximately 570,000 cords a year.

In spite of the heavy drain on the forests during the war period, cutting practices have actually improved as a result of the work of foresters, employed by the state and by federal agencies, with timber owners in demonstrating selective marking and cutting methods in sawtimber stands.

The favorable combination of climate and soil with an adequate rainfall which averages about 36 inches a year, produces factors very favorable to tree growth. Studies of growth in the upland white oak type involving stands in the 80-year age class, show a diameter growth of one inch in 7.7 years for white oak, and 7.1 years for red oak trees, ranging from 11 inches to 20 inches in diameter on areas where grazing had been permitted for many years.

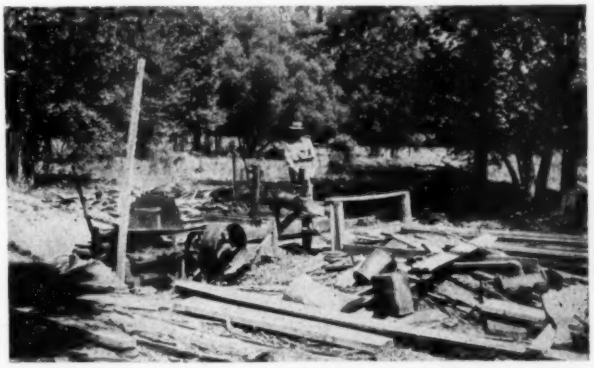
As has been noted earlier, the annual growth of forest products on the 2,248,000 acres classed as forest land, based on conditions as of January 1, 1945, is estimated at approximately 300,000,000 board feet of sawtimber and 878,000 cords of material in trees of less than sawlog size—an average of 133 board feet and four-tenths of a cord an acre. Such growth is distributed among three general "cover type," or tree-size classifications. Half of all the forest is sawtimber size; 20 percent is pole timber, and 30 percent of the area is covered only with seedlings and saplings.

Eight-tenths of all sawtimber increase is in the sawtimber areas, while two-thirds of the insignificant remainder is added to pole timber and the rest to the occasional tree standing among seedlings and saplings. In cordwood growth, the picture is somewhat different. Half a cord is grown upon each sawtimber acre each year, 0.41 cords upon each pole timber acre and 0.27 cords upon the seedling-sapling area. Here, then, is the clue to future success in timber growing, well known to foresters—wood can be grown fastest where the stocking is such as to make full use of the land.

If one begins with a total estimated volume of 5,480,000,000 board feet of sawtimber, uses an estimated annual growth of 300,000,000 board feet, and assumes an average annual drain of 54,000,000 board feet, or 18 percent of the annual growth, the total volume of sawtimber to be found in these woodlands at the end of 1954 may well amount to 7,800,000,000 board feet. The net growth of material in small trees has been estimated at 878,000 cords a year, and since the estimated annual drain of material from these trees is 400,000 cords, the net growth is 378,000 cords a year, or 3,780,000 cords for the 10-year period. The total volume in small trees, at the end of 1954, should be approximately 12,000,000 cords.

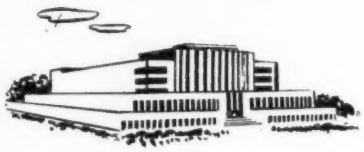
The most significant point to be raised in connection with such growth-drain comparisons, is that if forest practices can be made more effective throughout the state, the yearly commercial timber cut can be greatly increased, still without cutting more than will be growing. The real problem is, of course, to increase and improve forest growing stocks so that every acre will produce its proper quota of usable wood.

Since saplings are lacking, no forest will be left when mature trees are removed from this pasture



The typical portable mill used to saw Iowa farm woodlot hardwoods is a sketchy contraption

HOUSE OF WOOD MAGIC



CONCLUSION

By ERLE KAUFFMAN

Concluding a series of four articles on the war achievements of the U. S. Forest Products Laboratory at Madison, Wisconsin. The January issue featured war packaging; special containers and design and construction of wood aircraft were dealt with in February; in the March issue improved woods and wood-base materials were presented

ALONG with the "light box" developed at the U. S. Forest Products Laboratory at Madison, Wisconsin, to detect "compression wood" in either veneer or solid wood for military aircraft, was a direct stress fatigue machine, equipped with electronic mechanism, to determine the fatigue limit of material or its strength under repeated loads. Designers used it during the war to determine what actual stress they could use to assure safety, not only in aircraft, but in boats, bridges, buildings and other types of structure. Douglasfir, for example, was found to sustain, on the average, approximately four million repetitions of load in direct tension at 60 percent of its single-load strength.

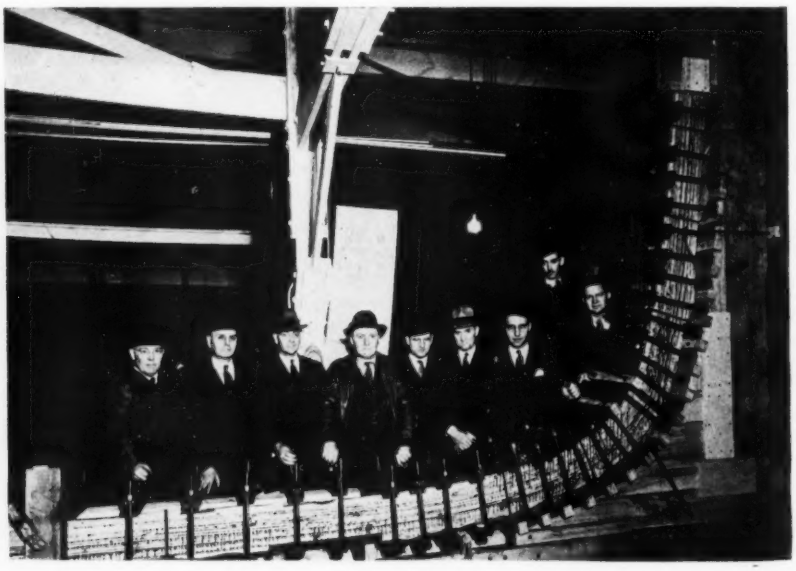
The laboratory also developed photoelastic apparatus to study stress concentrations at points where materials are joined together by bolts, screws, or other fastening devices, or where thin sections of material join thick sections. The importance of this is indicated by the finding of failures in joints and splices of static test aircraft wings at loads as low as 30 percent of the design load even when supposedly sound design practices were followed.

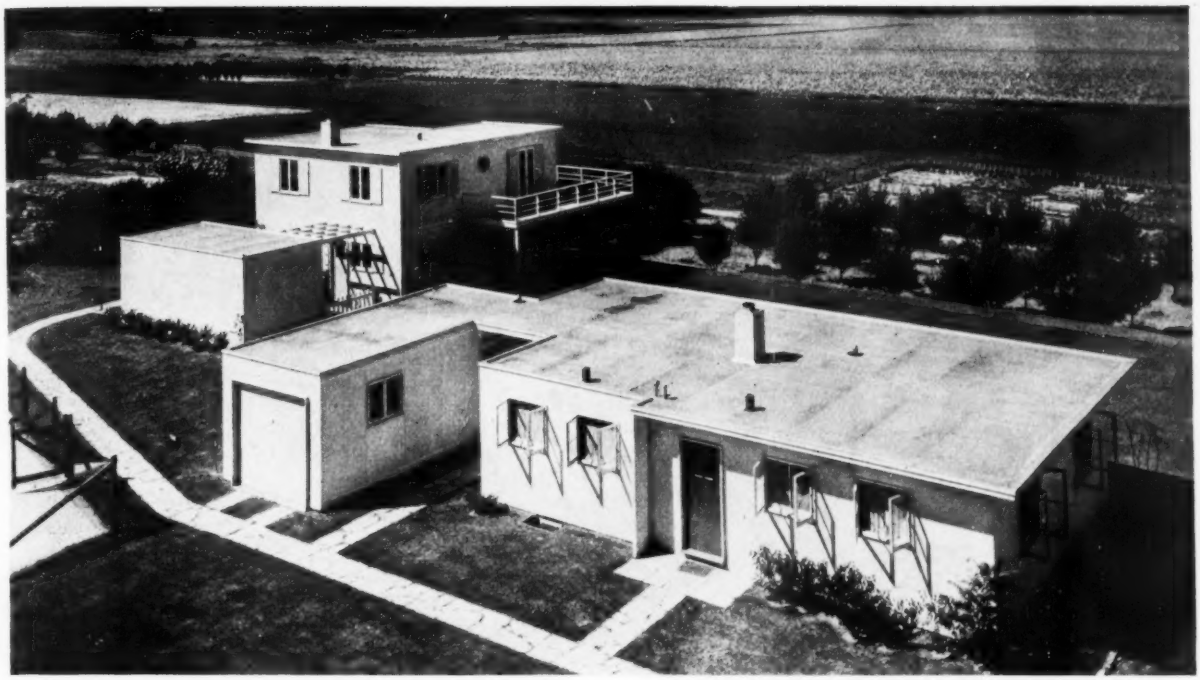
One method of studying stress concentrations involves the use of a polariscope. This instrument has a light source, generally a mercury-vapor lamp, a set of lenses to direct the light, and polaroid plates to polarize the light before and after it passes through the specimen. The image of the specimen is projected on the ground glass of a camera where it may be directly observed or photographed. Lines of contrasting light intensity appear in the image, and the number, direction and location of the lines provide the numerical data which are used in appropriate mathematical formulas to give the true stresses at or near any point in the material.

Being a specialty product, aircraft lumber requires extreme care in handling and seasoning to prevent degrade and loss of strength caused by the use of excessive dry kiln temperatures. The laboratory prepared specifications for the U. S. Army Air Forces that revealed safe kiln drying temperatures and also issued a publication giving suggestions to kiln operators that were directed mainly towards the elimination of checks, casehardening stresses and improper moisture content. To insure satisfactory compliance with these specifications and suggestions, the AAF Air Technical Service Command established a kiln certification program. Of the 123 dry kilns initially tested by the laboratory staff, 89 were recommended for certification, providing a monthly drying capacity of six million board feet of aircraft stock.

"This kiln certification program," said R. C. Rietz of the laboratory staff, "established a new high in the standards of commercial kiln drying. The techniques employed give promise of increased profits to the producer, of conserving the lumber that is now damaged in kiln drying and at the same time of increasing the consumer's satisfaction."

Lamination of wood ship timbers. Below, keel and stem in clamps ready for curing. At left, close-up of the finished product





Plywood plays a major part in the laboratory's system of prefabricated wood construction

Pointing out that the laboratory pioneered the design and development of lumber dry kilns, Mr. Rietz said that more than 5,000 commercial dry kilns in this country now employ the internal fan system of controlled drying invented at the laboratory to season lumber rapidly and safely. "Practically all new and remodelled dry kilns are now of this type," he said.

Electrostatic heating and gluing of aircraft parts such as spars, wing tip bows, ribs, longerons and stringers, bulkheads, seats, compreg propellers and propeller blanks is another little known but outstanding war accomplishment of the men of Madison.

"The development of generators of high frequency electrical energy and the exploration of fields of application of this energy, particularly for heating dielectric or low-conductivity materials, was begun a few years before the war," said M. E. Dunlap of Madison's veneer and plywood laboratory. "It received a great impetus, however, by wartime demands for accelerated production of wood and plastic articles.

"In the woodworking industry, high frequency is applied to glued assemblies to effect a rapid cure of the glue by raising its temperature. By setting the glue quickly, the necessity of holding assemblies in clamps or presses for several hours is eliminated and considerable saving in time, equipment and space results. In addition, the quality of the finished product is sometimes improved.

"In the majority of applications entire glued-up assemblies are heated to the desired temperature for curing the glue. However, since glue is a much better conductor of high frequency current than wood, some work permits the selective heating and curing of the glue with little heating of the wood by passing the current directly through the glue. In this case the glue is cured in a matter of seconds. Another method of application is by means of a specially designed 'gun' which concentrates the high frequency energy into very small regions. This is used to spot-glue wing and fuselage skins to the supporting structures and to tack veneers together in plywood molding operations, thus avoiding the use of metal staples."

A Pacific Coast plywood company, said Mr. Dunlap, is applying 300 kilowatts of high frequency energy to accelerate glue setting in plywood panels. Thirty-two four-by-eight-foot panels are heated at one time and the gluing is completed in 18 minutes, using a phenolic-resin adhesive.

A third major field of research and development carried on by the men of Madison during the war years was in lamination of wood ship timbers. This work resulted from shortages of large, high-quality white oak and Douglasfir timbers suitable for keels, stems, frames, skegs and other large structural parts of ships and boats, notably the PTs and the LVCP landing craft used by the thousands in amphibious warfare.

Laminated wood is produced by gluing relatively thin boards together, usually with clamp pressure, to form a thick timber. The fundamental purpose of laminating is to provide wood members that are relatively free of seasoning and other strength-impairing defects and that are of shapes, sizes and lengths not otherwise available. It is especially useful in making curved members in large sizes, which cannot be made of solid wood.

"The laboratory's part in the war program of lamination," said a spokesman, "was to find the best and most serviceable glues available,—glues, of course, which could be cured to become immune to water—determine the most efficient methods of producing laminated timbers with them, and test their strength properties as compared with those of solid wood equivalent parts. The amounts of heat and pressure applied in gluing the boards together are critical factors in this work, and had to be carefully worked out experimentally. Strength tests showed laminated members fully equal to solid members in strength, and in some parts definitely superior.

(*Turn to page* 184)

KNOWING YOUR TREES

SWAMP WHITE OAK

Quercus bicolor, Willd.

By WARREN D. BRUSH

THE range of the swamp white oak is included in that of the white oak but it does not grow quite so far north and is found in only a small part of the South where the white oak occurs. While the white oak prefers well-drained soils of coves and the upper bottomlands, swamp white oak, as the name indicates, is most often found in more moist localities on the borders of streams and swamps and in low, poorly-drained pastures and meadows. The two species also have many distinct differences in leaf, fruit and bark.

The name *bicolor* refers to the two contrasting colors of the leaves—dark green above and pale or often silvery white below. Swamp white oak is usually classed with the so-called "chestnut oaks," so named because the leaves have dentate and wavy margins similar to those of chestnut; in swamp white oak they may also be lobed, resembling somewhat other species of the white oak group.

The oaks, generally, show much variation in the form of the leaf, not only those of the same species on different trees, but often on the same tree. Another cause of confusion in identifying the oaks is that different species and varieties may cross, producing hybrids which have some of the characters of each parent. This might conceivably result in the development of a new species and is an indication that the oaks are in a stage of rapid development compared to other groups of closely related trees. Their occurrence in such large quantities over extensive areas is proof that they have been highly successful in their struggle for survival, due perhaps in large measure to their means of reproduction.

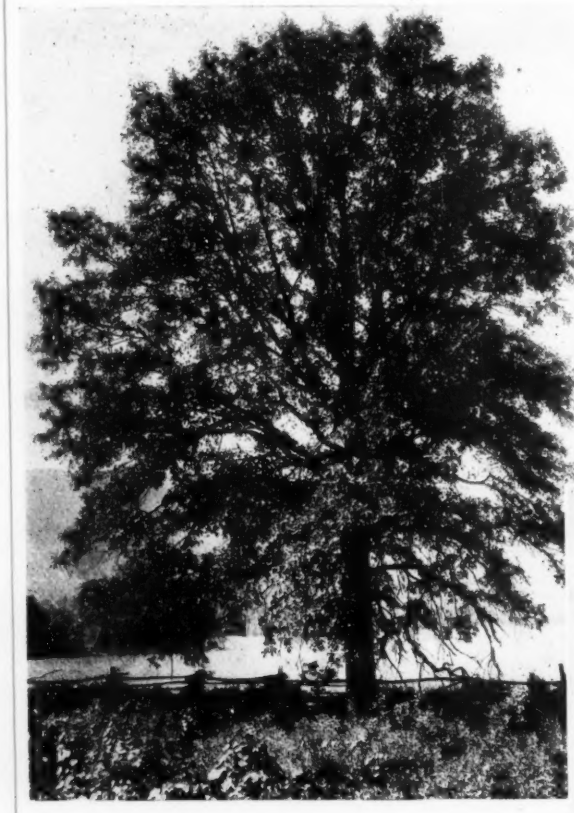
Swamp white oak is one of the less important oaks of the United States. It usually occurs in small groves widely scattered and nowhere very abundant. Its natural range is from southern Maine to southeastern Minnesota, south through southeastern Nebraska to eastern Oklahoma and southwestern Arkansas, northeast through northern and eastern Kentucky, and northward along the Atlantic Coast from Delaware to southern Maine. It is most common and grows to largest size in western New York, northwestern Pennsylvania and northern Ohio.

According to Joseph S. F. Illick in his book "Tree Habits," the largest ever reported was 27 feet in circumference; this was the Wadsworth Oak near Genesee, New York. Indians and early settlers knew it as the "Big Tree" near which Robert Morris made a treaty with the Seneca Indians in 1797.

Usually a medium-sized tree 60 to 70 feet in height and two to three feet in diameter, it has been known to attain a height of 100 feet when crowded by other trees in the forest. The trunks of isolated trees are sometimes six to eight feet in diameter. The rather small, tortuous branches are generally pendulous below and rise above into a narrow, round-topped open head. The upper portion of the short trunk is often fringed with short, pendulous branchlets.

An outstanding characteristic of the tree is its scaly bark. On young stems and small branches it curls back in ragged papery scales, displaying the bright green inner bark; on old trunks it is one to two inches thick and is deeply and irregularly divided into broad flat ridges covered by small appressed gray-brown scales, often slightly tinged with red.

The blunt-pointed winter buds, about one-eighth inch in length, have chestnut brown scales which are usually slightly hairy above the middle. The leaves are from five to six inches long and two to four inches wide, much broader toward the tip and wedge-shaped at the base, irregularly toothed, scalloped, or lobed sometimes half-way to the midrib. Light bronze-green when



The rather small, tortuous branches of swamp white oak are generally pendulous below and rise above into a narrow, round-topped, open head. The upper trunk is often fringed with short drooping branches

they unfold, and dark green and lustrous at maturity, they turn dull yellow-brown or occasionally orange color in the autumn.

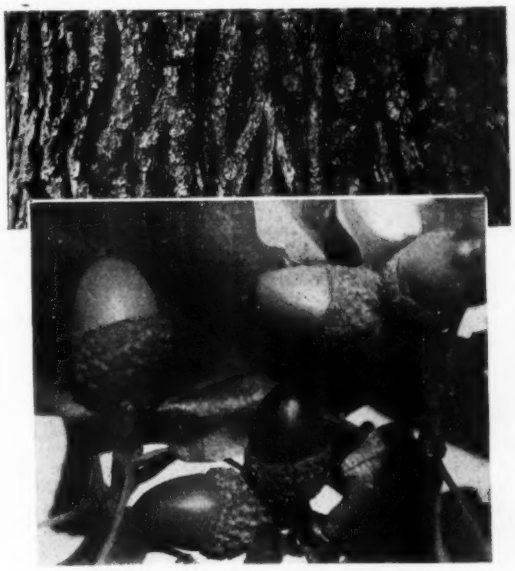
Flowers of both sexes are found on the same tree, appearing in May or June along with the leaves. The male, or pollen-bearing, ones consist of clusters of hairy catkins three to four inches long; the female, or acorn-producing, ones are borne on elongated slender stems covered with thick white or yellowish woolly hairs.

The light chestnut brown acorns, three-fourths to one and a quarter inches long and one-half to three fourths of an inch thick, usually occur in pairs. They are enclosed for about one-third of their length in the thick, light brown bowl-shaped cup which is lined on the inside with fine hairs and roughened on the outside by thin scales, which form a short fringe-like border on its rim. The long, slender stalks, one to four inches in length, on which the acorns are borne, are a distinguishing feature of this species. The nuts ripen in September and October of the first season and the white, sweet kernels are eaten by squirrels and other animals.

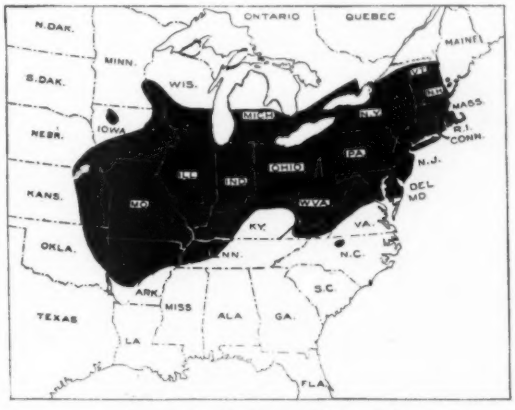
Often the swamp white oak is confused with the swamp chestnut oak especially where the ranges of the two species overlap in eastern Maryland, Delaware and New Jersey, and in western Tennessee and Kentucky. The long stalks of the acorns readily distinguish it from the swamp chestnut oak which has short stalked fruit and, generally, a broader crown and stouter trunk.

While the supply of swamp white oak timber is small, the wood compares favorably in quality with the best white oak and is suitable for the same purposes. The stand of swamp white oak of sawtimber size has been estimated at 400 million board feet, which is only about one percent of the total stand of all the species of the white oak group.

A cubic foot of the air-dry wood weighs 50 pounds, which is two pounds more than the weight of white oak. It is heavy, hard, stiff and strong, and has high shock-resisting ability. Because of its resistance to decay, the wood is suitable for railway ties, even without preservative treatment. It is also valuable for tight barrels to hold liquids and for mine timbers. In the form of lumber some of the most important uses are furniture, railway cars, flooring and other interior finish.

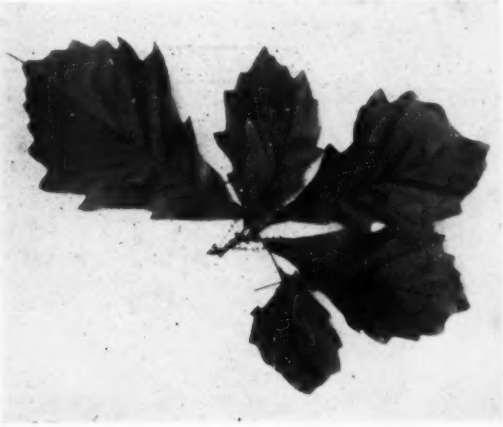


Old bark is gray-brown, irregularly grooved. Light chestnut brown acorns usually occur in pairs



Range of the Swamp White Oak

The pollen-bearing blossoms appear in May or June



The leaves resemble those of chestnut and chestnut oak, but are often irregularly lobed

A Memorial Forest Is Born

(*From page* 161)

in on this reforestation investment, her net profit would have exceeded $25,000 on some 25,000 evergreen trees planted just six years ago.

Recently Willson, now superintendent of the Water Board, stated that where formerly a half-inch rain seriously muddied the reservoirs, necessitating costly repairs and expensive chemicals to clear the water, a heavy two-inch rain is now required even partially to muddy the water. Those 40 planted acres are doing their job well.

The city hopes to add gradually to its holdings so that it will eventually own most of the watershed surrounding both the Edgemont and Smithsburg reservoirs. Meanwhile, the Water Commissioners are supplying free trees to farmers who will plant them on the watershed.

The watershed area contains many places of unusual scenic and recreational value. Two turbulent mountain streams feed the reservoirs; unusual cliffs and rock formations abound; a stony prehistoric creek bed, the Devil's Race Course, with the water 15 to 20 feet below the "surface" of the stream, is an oddity. The Appalachian Trail crosses the watershed, and an open Adirondack-type log cabin shelter is available for public use.

It was just a year ago that the senior writer, in his capacity as extension forester of Maryland, received two letters. One was from Vernon Holter, then assistant agricultural agent for Washington County, and the other was from Superintendent Willson. The first stated, in part, "Our 4-H boys and girls would like to establish some type of school or other forest. Have you any suggestions?" The second, "We wish to continue the plantings we began six years ago. Can you suggest how and where we can secure labor, under present conditions, to do this?"

It was only natural that the two interests were combined to result in Maryland's first memorial forest.

D. Raymond Snively, Hagerstown businessman, farmer, sportsman, and sponsor of the Washington County 4-H Conservation Club, summed up the cooperative effort that followed in an address during the dedication ceremonies. "The city of Hagerstown owns this land," he said, "and the Board of Water Commissioners manages it. Our local soil conservation district surveyed, planned and assisted in preparing the planting site. George Scholl, local farmer, plowed contour furrows that the trees might better survive. An out-of-state seedsman provided memorial seeds, the State Forestry Department grew the seedlings. Local newspapers gave adequate publicity to the memorial project. Our citizens endorsed it. Civic and farmer organizations gave their active support. Washington County 4-H Club boys and girls sponsored the Memorial Forest and the Maryland Extension Service coordinated all interests and activities to this successful conclusion."

The dedication ceremony, while eloquent in its simplicity, was extremely colorful. After William Doub, president of the Council of 4-H Clubs of Washington County, led in the pledge to the flag of the United States, Mayor Richard Sweeney congratulated all industries and agencies which had taken part in conceiving and helping make the memorial forest possible. Then a youthful 4-H member came forward with a mattock and bucket of trees. After planting the first tree, Mayor Sweeney introduced the members of his City Council, each of whom planted a tree.

Pfc. Fred Wishard, a wounded war veteran, hobbled forward on crutches. Plainly affected by the solemnness of the occasion, he expressed, in behalf of the county's veterans of World War II, "our appreciation of this memorial." With Lieutenant Elmer L. Myers, who escaped from a German prison camp, he then accepted the memorial forest on behalf of their comrades "still at war".

Within sight, but beyond sound, the first Fairchild plane circling above, was now joined by another.

Club Leader Doub then spoke for the 4-H group. "We, the 4-H Club boys and girls of Washington County, accept full responsibility for the establishment and maintenance of the memorial forest," he said. "We, as farm youths, know full well, and at first hand, the necessity of caring for young growing things, and we pledge that we will properly plant and care for each tree. Fellow 4-H'ers, plant your trees, well and carefully."

Swiftly, now, the pilots of the circling planes, testing treacherous mountain updrafts, zoomed downward, made a quick circle, and, with motors idling, glided over the upturned faces of the group below. A quick zoom upward, another graceful circle, and the F-24's soared towards a recently lumbered-off 40-acre tract of woodland.

In one plane rode Donald Frush, a 4-H Club member of Big Pool, Maryland. It was a particularly significant occasion to Donald, a freshman at the Clearspring High School, for he was chosen for the plane ride because of all Washington County 4-H boys or girls, he had the greatest number of relatives in the service.

In the plane with Donald was a burlap bag in which, carefully mixed with sawdust, were 6,964 hemlock seeds—a seed for each man and woman from Washington County in the armed forces. As the plane glided over the 40 acres, Bombardier Frush released his seed bomb, and the small memorial seeds slowly drifted over the land.

The youngsters on the ground then lined up for their tools, trees and instructions—a husky boy to wield the mattock, a lighter youngster to plant the tree. Soon one small field was completely planted. Meanwhile, on another portion of the forest, the guests and visitors, male and female, young and old, all planted at least one tree—some for a son, some for a daughter, some for a friend.

Meanwhile, workers of the Board of Water Commissioners had constructed two huge bonfires down the hollow beside a bubbling spring under a dense grove of hemlocks—also part of the forest. Here, on a long, roughly improvised table were ice cream, soda pop, cake and chocolate milk, gifts of the grateful citizens of Hagerstown to its youthful foresters.

News of the memorial forest slowly filtered to all sections of the world where Washington County service men and women were stationed. Months later, County Agent Mark Miller received a letter from Guam. Lieutenant Allen F. Secor, S/Sgt. F. Herbert Robertson and Pfc. Richard Brumbaugh wrote, praising the 4-H Club and the city of Hagerstown "for the memorial which will benefit not only those of us in the services but every other person in Hagerstown and in the nearby vicinity, which no cold shaft of stone or metal could ever do. And so we pass on to you a word of thanks and congratulations for the worthwhile deed you have done us. May the Hagerstown Memorial Forest grow and become a beautiful and useful area, befitting the thoughts of those who planted it and the deeds of those whom it memorializes."

Today, in every city, town and hamlet in America, grateful citizens are seriously considering the establishment of suitable memorials dedicated to the heroic services rendered by their sons and daughters in the recent great conflict. While their elders debate the type and cost of the memorial, impatient youth often takes over the job. Such was the case when the Washington County 4-H Club youngsters decided to sponsor their memorial forest. Far less than a month elapsed since the conception of the idea to the birth of the forest. What these youngsters accomplished can easily be duplicated elsewhere throughout the United States.

U. S. Foresters Aid Paraguay

Two United States foresters have been sent by the Inter-American Development Commission to Paraguay to collaborate with the government of that country in establishing a program for the commercial and industrial utilization of its forest resources.

A technical mission made a study of Paraguay's resources and industries last year; as a result of this survey, George W. Uderitz of the U. S. Department of Commerce, and Eugene C. Reichard of the Department of Agriculture, have been loaned to the Inter-American Development Commission to put into operation the following program:

Organization of wood turning and shaping shops into mutual assistance associations to assure quantity production, standards of quality and export market development and expansion; a study of native woods to determine their suitability for commercial products for domestic and export consumption; establishing standardization, grading, and seasoning; establishing a modern, heavy-duty, vertical band sawmill and dry kiln; establishing a program of reforestation of cut-over non-agricultural lands; studying colonization of cut-over lands suitable for agriculture, and studying possibilities of lowering export charges on lumber and semi-manufactured and converted wood products.

Day Heads Wildlife Service

Dr. Ira N. Gabrielson, director of the U. S. Fish and Wildlife Service, will retire on April 1, and will be succeeded by Albert M. Day, now assistant director.

Dr. Gabrielson has been director of the service since it was formed in 1940 through consolidation of the old Biological Survey, of which he had been chief since 1935, and the Bureau of Fisheries. Beginning his government career in 1915 as an assistant economic ornithologist, he was sent to Portland, Oregon, four years later to take charge of the rodent control program. In 1931 he became regional director and served in that capacity until 1935 when he was brought to Washington as principal biologist. Within six months he was named chief of the Biological Survey.

Dr. Gabrielson was in large part responsible for the extension of the national wildlife refuge program, for the state-aid program under the Pittman-Robertson Act, and for the work of the service in building up the migratory waterfowl population.

Mr. Day, a veteran of 27 years of government service, is a native of Nebraska, and received his B.S. degree from the University of Wyoming in 1922, majoring in animal husbandry and biological sciences. First employed by the Biological Survey in 1919, he became leader of rodent control work in Wyoming the following year, and in 1928 was placed in charge of a staff of professional hunters assigned to protect Wyoming livestock from predators. In 1930 he was transferred to Washington, D. C., and in 1938 was appointed to administer research and restoration work in cooperation with the states.

Albert M. Day

In 1941, Mr. Day was named liaison officer from the Fish and Wildlife Service to cooperate with defense agencies. When the service was decentralized and moved to Chicago in 1942, he became assistant director. Since that time he has been largely responsible for the field administration of the service's operations.

Canadian Elm Disease Surveyed

At the invitation of Canadian plant-pest officials, the U. S. Department of Agriculture recently surveyed a Dutch elm disease infection widely scattered in Canada for some 180 miles along the St. Lawrence River northeast and east from Montreal.

Since the southernmost infections are only 30 miles north of the New York State border, this survey is of particular interest to Dutch elm disease control authorities in this country. Unlike most of the infection centers in the United States, the Canadian area is not infested with the smaller European elm bark beetle, but does show an abundance of the native American elm bark beetle.

A Million More Walnut Trees

The walnut industry having depleted its natural resource faster than it has been replenished by nature, W. C. Finley, American Walnut Manufacturers Association forester, has requested each walnut manufacturing company to collect and furnish without charge at least 50 bushels of walnuts to the state nurseries. The goal is to "plant one million walnuts in the spring of 1946" in Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Ohio, Tennessee, West Virginia, Nebraska, North Carolina, Oklahoma, Virginia and Wisconsin.

Collingwood Resigns

G. Harris Collingwood, chief forester in charge of the conservation program of the National Lumber Manufacturers Association since 1940, resigned on March 15 to enter private business. All forestry activities under his direction will be transferred to the newly reorganized Forest Products Industries.

Mr. Collingwood is well known to the readers of AMERICAN FORESTS as the author, up until 1946, of the monthly feature "Knowing Your Trees," which also is published in book form under the same title, and of many other articles. From 1928 to 1940 he was forester for The American Forestry Association, and prior to that was in extension work with the U. S. Forest Service.

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Fine Art of Fly Fishing

(*From page* 159)

possibilities, ideal to float a fly.

Wade out to mid-stream, just below the lower end of the pool you wish to fish, and stand quietly before making the first cast. Trout always lie with their heads pointed into the current. You will soon learn that the successful dry fly caster must wade to present his lures to the best advantage and effect, for every move made by an angler standing on the bank of a stream is visible to the fish. Knee-deep in the stream, the careful wader is hardly noticed and only partially visible to fish.

Having decided that the first place to cast, in your progression upstream, is the lower lip of the pool, you make a short high cast a few yards above the desired spot, holding the rod high so that only the fly rides on the current that is drawing it downstream. This allows the lure to travel at the natural speed of food carried normally on the water; it further facilitates the hooking of a rising fish.

If your judgment and float of the fly is good, and a trout flashes at the moving lure, you give a slight but instantaneous flick of the wrist. That will set the hook—and the battle is on. Play your fish to one side, out of the current and away from the unfished water ahead, so as not to disturb other trout. When played out, net carefully, and if you do not wish to keep the trout hold it only by the jaw with thumb and forefinger, remove the hook and place (don't drop) the fish back in the water.

Never touch the body of a trout you plan to release. This is not theory, but a fact gleaned from years of experience, that proves to the writer at least that trout handled in this manner seldom die. A high mortality and infection rate results when bodies are touched. If you wish to keep the fish, hold it tightly in left hand, head up, jaw to left, place ball of right thumb in upper jaw, give a sharp downward snap of your hand and break the trout's neck, killing it instantly.

Having exhausted the possibilities of the lower lip of the pool, move upstream carefully, fishing all water with planned casts designed to keep current drag from making the fly move unnaturally. Now, standing in the pool itself, move your casts upstream until you reach the limit of your casting ability. You do this with particular regard to the fact that one carefully executed cast is worth a thousand aimless ones.

If a large trout is raised and you fail to hook it, stand still, light a cigarette and smoke it through slowly before attempting further casts. Meanwhile, do not reel up your slack line, but hold it in a hank ready for your next try. It is well to know the exact length of line necessary to reach the fish you are "resting," so that other casts can be made with a minimum of "false casts." A varied colored fly line is always useful in determining the length of casts. A wise stream angler also uses his spare time, while "resting" fish, to look around and observe casting hazards, other fish rising to feed and the path of currents through the pool.

When you feel that the time has come for another cast, use all your skill and knowledge to make it perfect, keeping your wrist ready for the rise that generally answers the well-placed fly.

Keep on casting carefully upstream to the head of the pool, then work all likely places in the riffles up to the next pool. In fast water, you will find pockets in front of and back of rocks and under stream banks. And sometimes even a good trout will be caught in the channel. Shallow fast riffles are a good place to fish early morning and late evening, when trout come out of hiding to feed. Float your fly on this fast water in the manner already described—on the current.

Frequently, you find branches and other obstructions immediately behind that make a conventional cast impossible. In this case, use a simple roll cast. This is done by laying your line on the water in front of you, with the tip of the rod horizontal. Then raise the tip quickly, with a circular motion of your wrist, thrusting it forward. This will throw a loop of line forward, drawing the line out through the rod guides. Repeat this until the desired amount of line is cast out.

Where the overhang is so low that you cannot make a regular overhead cast, the right-handed caster should kneel on the left side of the stream and cast upstream with a side horizontal motion. Sometimes even this cast will not work, in which case work your way upstream along the bank. Holding a few loose coils of line in your hand, allow your fly and leader to float downstream with the current into the desired part of the obstructed pool. This irregular method of floating a dry fly will work if you are well hidden. And it can be made more effective by retrieving your fly against the current, with a twitching motion of the wrist.

A trick often successful on extra smart big trout in quiet water is to float a fly on a dry leaf or chip until it reaches the old timer's hiding place. Then hop the fly off its raft in a life-like manner, adding the motion of a struggling insect. Brown trout frequently fall for the swimming insect stunt if your leader is fine enough not to make a heavy shadow on the bottom of the pool.

Speaking of leaders, you cannot use one that is too light. If the tackle you use is fine and light and your wrist is not too strong when you set the hook, you will be successful. There is no doubt but that the finest leaders and smallest flies lure the most trout. Such gear is expensive to use while learning because you lose much tackle and many fish. But it will surprise you how large a trout you can take on a leader that tests only eight ounces—once you know how to use it. Frequently these tiny flies will hold big fish better than medium-sized ones. This is because a tiny No. 20 hook will take hold of the skin on a tough old trout jaw, whereas a larger hook will not hold.

A modern touch in the dry fly game is the general reduction in the length of leaders, due to the use of finer and lighter leaders made of nylon. These leaders make almost invisible the connection between line and fly. Where six to nine foot leaders were in common use just before the war, leaders four to six feet long are now available. In actual practice, the writer has caught two trout on a four-foot leader where others, using a conventional seven and one-half foot leader, caught but one. While nylon can and will slip if improperly tied, it will never slip if the angler ties a simple overhand knot in the end, after threading the leader through the eye of the fly, and then makes a surgeon's knot, which he jams against the former knot.

In selecting flies for dry fly fishing, be sure to stick to dun colors and get an assortment of fan-wings, uprights, spent-wing, Palmer, spider and Gyro flies. Use light colored flies on bright days.

Where to fish is a problem you can solve by looking over the prospectus of your 152 national forests. But don't overlook the water close to home—frequently the largest fish are caught there.

CONSERVATION IN *Congress*

By A. G. Hall

THE treatment of the Agricultural Budget estimates by the House Committee on Appropriations indicates an increased national interest in forestry. The appropriations bill (H.R. 5605), which passed the House on March 11, makes substantial increases over the expenditures of the current fiscal year. While certain of the recommended increases were reduced somewhat, the bill generally is not one to indicate that forestry will suffer at the expense of budget-balancing.

For forest and range experiment stations, the House approved increases of $252,000 for existing work centers and $480,000 for the establishment of 16 new ones in the fiscal year. An additional $144,000 (for spruce budworm investigations) in a supplemental estimate was likewise approved, making the forest and range research item in the bill as passed by the House, $624,000 greater than that originally estimated in the budget. The research items for forest products and the Forest Survey were passed by the House without change from the budget estimate.

The only reductions made by the House in the Forest Service estimates as shown in the February issue of AMERICAN FORESTS, were: $479,000 from the increase for aerial photography and mapping; $50,000 from a proposed increase of $100,000 for supervision of national forest use; $250,000 from the amount of forest receipts to be spent for land acquisition; and $10,000,000 for forest highways from the total of $36,214,222 for forest roads, trails and highways.

While the committee approved the budget item for white pine blister rust on federally owned land under the Forest Service and the Department of the Interior, it reduced by $1,500,000 the estimate for federal cooperation in the control of blister rust on state and privately owned lands. The committee's opinion was that the states and private landowners should share a greater part of the program on their own lands. This action was no indication that the House is unaware of the importance of the blister rust work, but rather an expression of a policy involving the manner in which federal funds should be expended.

The budget estimate for forest disease investigations under the Bureau of Plant Industry was reduced by $30,300, funds which were to have been used in the investigation of newly-discovered tree diseases.

A supplemental request for $60,000 for the National Arboretum was reduced to $30,000.

Senator Thomas of Oklahoma, introduced on February 28 a bill which would extend federal assistance to prevent and control outbreaks of destructive insects and diseases on all forest lands within the United States, irrespective of ownership. It is designed to provide assistance similar to that now being provided in the case of white pine blister rust under the Lea Act.

CONSERVATION CALENDAR

Important Bills in Congress With Action to March 19, 1946

Bills Enacted

S. J. Res. 105 (H. J. Res. 265)—(H. Res. 510)—To provide for proceeding with certain river and harbor projects heretofore authorized to be prosecuted after the duration of the war. Approved February 18. Public Law No. 300.

H. R. 3028—BONNER—To amend the act of August 17, 1937, as amended, relating to the establishment of the Cape Hatteras National Seashore Recreational Area in North Carolina. Approved March 6. Public Law 310.

H. R. 4932—MURDOCK—To amend

Section 9 of the Boulder Canyon Project Act, approved December 21, 1928. Approved March 6. Public Law 318.

Appropriations

H. R. 5605—TARVER—Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1947. Introduced and reported (Report 1659) February 27. Passed House March 11.

H. R. 5400—Making appropriations for the fiscal year ending June 30, 1947, for civil functions administered by the War Department. Passed House February 7. Passed Senate March 19, with amendments.

Governmental Functions

S. 1839—HATCH—To provide basic authority for the performance of certain functions and activities of the National Park Service. Referred to the Committee on Public Lands and Surveys, February 15.

Insects and Tree Diseases

S. 1863—THOMAS—To provide for the protection of forests against destructive insects and diseases. Referred to the Committee on Agriculture and Forestry, February 26.

National Forests

S. 913—HAYDEN—To protect scenic values along and tributary to the Catalina Highway within the Coronado National Forest. Passed Senate, February 21. Referred to the House Committee on Agriculture, February 25.

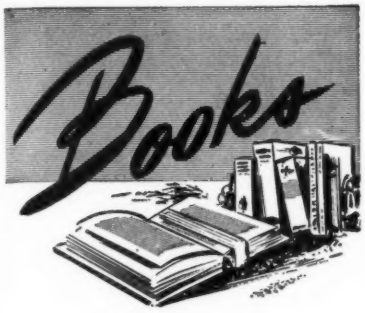
S. 1226—HATCH—To adjust the exterior boundaries of the Kaibab National Forest, the Grand Canyon National Game Preserve, and Arizona Grazing District No. 1. Passed Senate, February 21. Referred to House Committee on Agriculture, February 25.

National Parks

S. 1273—HATCH—To provide for the acquisition by exchange of non-federal property within areas administered by the National Park Service (Glacier National Park). Passed Senate February 21. Referred to House Committee on Public Lands, February 25.

Public Lands

S. 1945—ROBERTSON—To provide for the granting of public lands to certain states, for the elimination of lands from national forests, parks, monuments, reservations, and withdrawals in connection with such grants. Referred to the Committee on Public Lands and Surveys, March 14.



FOREST PRODUCTS RESEARCH GUIDE, prepared and published by American Forest Products Industries, Inc., 1319 18th St., N. W., Washington 6, D. C. 142 pages. Price $2.

The purpose of this book is to catalogue all the organizations having information on various phases of wood research as an aid to the coordination of forest products research. Some 460 types of fundamental and applied research are itemized. Brief descriptions of types of investigation, completed or under way, are given with the names and addresses of individuals or organizations conducting them. The agencies listed include 130 universities, 65 government bureaus, 100 producers, 300 consumers and processors of forest products, over 100 technical societies and private laboratories, and over 50 trade associations.

IMPROVEMENT CUTTINGS IN MIXED HARDWOODS, by H. H. Tryon and R. F. Finn. Published by the Black Rock Forest, Cornwall-on-Hudson, New York. 5 pages, illustrated. Price 45 cents.

A study of improvement cuttings in an uneven-aged stand of mixed hardwoods and hemlock, from 1927 to 1941, which resulted in a promising stand capable of producing valuable timber.

PLANT LIFE OF THE PACIFIC WORLD, by Elmer D. Merrill. Published by The Macmillan Company. 295 pages, illustrated. Price $3.50.

This book is a thorough yet concise account of the subject. Particularly is it of value to the lay reader who will find himself interested in plants, forests and islands that he never knew existed. Especially revealing is it in separating fact from fiction generally accepted regarding the tropical jungles, while explaining how these stories possibly originated. Dr. Merrill has studied Pacific plants for 42 years and makes his findings clear.

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4-46

House of Wood Magic

(*From page* 171)

"So successful was this program that, before the war had ended, lamination of both straight and curved ship and boat parts was being done in several navy yards as well as by private manufacturers. The glues recommended by the laboratory proved entirely satisfactory in use; cases of deterioration declined almost to the vanishing point. At first, newly developed phenol glues were cured sufficiently to give strong and durable joints in white oak when heated 10 hours or more in a humidity-controlled chamber at 190 degrees. Later glues of the resorcinol type were developed for curing at much lower temperatures, actually at normal room temperature for some species."

One manufacturer, with information provided by the laboratory, produced laminated skegs at the rate of 70 a day for the LCVP landing craft. The same firm produced 11,000 keels for landing craft and keels and stems for 100 PT boats in two years. And boat builders reported that, when labor costs, waste and inspectors' rejections are taken into consideration, there is little difference in the cost of solid wood and laminated structural parts.

Results of the laboratory's research were also applied in the manufacture of laminated parts of wood truck bodies produced by the thousands for Army vehicles; and laminated structural timbers were widely used in aircraft factories, hangars, ship moldlofts and other buildings requiring large areas of floor space unobstructed by supporting columns.

Although the laboratory has been interested in the problem of producing industrial alcohol from wood waste for 30 years, and was instrumental in developing a process that supplied several million gallons during World War I, this fascinating field of research was not fully explored until late in 1942. At that time wartime demands made it necessary to produce alcohol from corn and wheat at high cost, so the War Production Board requested the laboratory to study the German Scholler process of utilizing wood waste for this purpose.

"With pilot plant fermentation apparatus," said a laboratory spokesman, "technicians adapted and quickly improved upon the Scholler process. It developed the German batch process into a continuous one and cut the time necessary for alcohol production to one-eighth that required in

Germany, while at the same time stepping up yield of alcohol per ton of wood by about 10 percent."

Early experiments led to the development of a new process known as the "Madison wood-sugar process," which, according to Dr. E. E. Harris of the pilot plant laboratory, shows promise of producing alcohol from wood at prices that may compare with alcohol from any source, provided large quantities of wood waste are available at a low cost. And if markets for by-products can be found, he added, the cost would be even lower.

"More than 300 pilot plant runs have been made at the laboratory," said Dr. Harris, "covering a number of the major woods of the United States. Softwoods produce 25 percent more alcohol than do hardwoods. Most of the work has been on Douglasfir because wood waste from this species is available in large quantities in concentrated areas.

"The process is a continuous treatment of a charge of wood waste with approximately one half of one percent sulfuric acid carried on until the concentration of reducing sugar being removed is less than one percent. The time required for the complete hydrolysis is about three hours. About eight parts of the acid solution to one part of dry, bark-free wood are used."

A system has been developed, he revealed, for "flashing" the sugar solution coming from the hydrolyzer. This permits recovery of methanol and furfural produced in the process.

A plant rated to produce four million gallons of ethyl alcohol a year was begun in Oregon in 1944, to use the new laboratory process. While construction was under way, continued laboratory research made possible a large increase in its potential output as well as cutting down eventual production costs by developing by-products. Among these, in addition to methanol, furfural and lignin, was a fodder yeast rich in vitamin content and suitable for poultry feed. One and one-half gallons of furfural and the same amount of methanol are produced per ton of wood waste.

The Oregon plant is not yet completed, but as a result of by-products made possible through the laboratory's research, it is believed that production of ethyl alcohol from wood may be able to compete with that from molasses even under peacetime conditions, thus providing a steady outlet for much milling refuse now wasted.

A little known phase of research at Madison played a highly important part on the home front during the war. Of the thousands of houses in-

The Rush for the Cherokee Strip—On April 12, 1889, at noon, about 50,000 people raced for the best land sites. The founders of our company were bringing pipe-pleasure to smokers in many States. Their shop was located then at 129 Grand St., New York.

cluded under the war housing projects, 25 per cent were prefabricated, many of them utilizing the "stressed-covering" principle as developed at the laboratory.

"In a system of factory fabricated houses developed at the laboratory," said R. F. Luxford, of the laboratory staff, "plywood is a principal material. The housing units or panels utilize the 'stressed-covering' principle so successfully applied in aircraft construction to secure strength and lightness; that is, plywood sheets forming the panel faces are glued to both sides of a structural framing and thus become a definite part of the load-carrying system. The rigid attachment of the facing to the studs and joists by means of gluing results in a high resistance to shear and makes the parts act together. A floor panel with stressed covering acts as a unit like a box girder and, as a result, the floor panels when two-by six-inch joints are used will deflect only about one-quarter as much under a given load as the joists acting alone."

Thus did the U. S. Forest Products Laboratory, the house of wood magic, serve the nation during the most critical years in its history. And its war record as disclosed in this series represents only the highlights of its service. For example, its technicians assisted small arms manufacturers in obtaining and drying suitable woods for gunstocks; textile plants, faced with a scarcity of dogwood, the preferred species for shuttles and bobbins, were given information about other woods with the necessary hardness to perform satisfactorily; pulp and paper manufacturers were shown how to use hardwoods to make paper in place of the favored softwoods.

Needless to say, the laboratory's wartime achievements can and will be adapted to the peacetime needs of the country. Better packaging, a wide variety of consumer uses for the new modified woods such as impreg, compreg and staypak, better and more durable construction material—these but touch upon the new era in wood utilization that is dawning for a nation at peace. And for this the nation can thank the men of Madison.

How to Use DDT

(*From page* 155)

out following the dusting operation were not affected. This fact was particularly advantageous to us in that the larvae continued to work on black aphis. . . . It appeared that black aphis were not affected by the dust."

However, the householder in controlling his local insect pests should remember that the physician does not give the same medicine for all ills. If insect attack of one kind or another is sufficiently advanced to warrant the use of DDT, it may have to be done even if the ladybugs and other beneficial insects are killed in the process. One can always take care of the aphis, if necessary, with a nicotine spray, the same as he did before DDT became known.

As to upsetting the balance of nature by the use of DDT, the entomologists point out that the reason one uses an insecticide is because the balance has already been upset and that the use of DDT, or any other insecticide for that matter, is the first step in returning nature to a balance. This is especially true in the case of widespread infestations such as those of the spruce budworm which now has foresters and landowners in the northern states and Canada marshalling their forces against another repetition of the destruction which occurred from 1910 to 1920 when 225 million cords of pulpwood timber were killed by this pest.

Before infestations reach such proportions, the use of DDT or other effective insecticide surely seems warranted, especially if done with all the necessary caution to preserve other forms of life in the area. In such instances the use of DDT can wipe out the offending insects, and probably take with it many others, but, if the application is limited to the infested area, nature has a chance to resume its balance by the migration of beneficial forms of insect life from adjacent areas. Fortunately, the toxic effects of DDT in the forest are relatively short-lived, if the minimum effective dosage is used.

Experiments in the control of forest insects with DDT indicate that no other development in the past 25 years has offered so much promise, particularly for the control of defoliators. Judging from these experiments, DDT is far more effective in low concentrations than any other commercial insecticide. Because of the small amount required an acre, it is especially well adapted to application from airplanes, for the protection of extensive areas of valuable timberland. Its toxic effect on bene-

ficial insects, fish and wildlife, however, causes the entomologists to move with caution.

Since DDT has proved to be by far the most economical of all insecticides for forest use, aerial application costing only about two dollars an acre as against six to ten dollars for other types of insecticides, one can be sure that forest entomologists will do their best to develop concentrations and methods of application which will reduce the harmful insect populations without unwarranted danger to other forms of forest life.

The range of testing against forest and shade tree insects includes the defoliators, bark beetles, wood borers, termites, and a number of sucking insects. DDT has been applied in the form of suspensions, solutions, and emulsions, by means of airplanes, high-powered sprayers, knapsack sprayers, and hand atomizers. Because early experiments showed that the DDT dust was effective only in a few specific cases and that suspensions of DDT likewise were not wholly effective, most of the subsequent experimental work has been done with solutions and emulsions. However, the newer types of wettable powders may prove to be effective when applied in suspensions from airplanes. Recent developments in the use of power blowers for dusts and oil concentrates have been spectacularly successful in the control of shade tree insects.

Tests in Colorado against the spruce budworm have demonstrated that the insect can be controlled with dosages as low as two and a half pounds of DDT an acre when applied with a power sprayer. Applied before the larvae began their feeding activity in the spring, this treatment not only killed off the budworm larvae but continued effective against the moths several weeks later, thus taking care of two generations with one spraying. Large-scale aerial applications have produced very encouraging results with less than one pound of DDT in one gallon of oil an acre.

Tests against the red-headed pine sawfly in a red pine plantation in New York were made by applying one pound or less of DDT an acre. These were completely effective.

Similar results have been obtained against the gypsy moth and the green-striped maple worm. It appears therefore that as little as one pound of DDT in one gallon of liquid an acre

will produce good results, especially when the volume of foliage to be treated is small. In many cases, 100 percent kill is not necessary. Generally a dosage sufficient to prevent heavy defoliation is all that is needed to effect the desired control.

Extensive experiments have been conducted in the control of the smaller European elm bark beetle, the insect which carries the Dutch elm disease. Solutions and emulsions containing two to five percent of DDT were effective in preventing, for more than 110 days, crotch feeding in living elm trees by adult beetles. Lower concentrations were effective for shorter periods.

Adults of the locust borer were killed when DDT was applied as an emulsion either to the goldenrod on which the beetles feed or on the stems of locust trees prior to the beetle's depositing their eggs.

A one percent DDT emulsion has proved effective against the white pine weevil.

Satisfactory control of carpenter ants in log cabins has resulted from spraying a 5 percent DDT solution in kerosene.

Tests to date indicate that DDT may prove to be a valuable insecticide for the protection of valuable logs from the attacks of bark beetles, ambrosia beetles and wood borers. Protection lasting two months was obtained with a 10 percent solution in deisel oil or kerosene, and DDT has been shown to be toxic to termites, both as a soil poison and in treated wood. It is considered necessary to carry on these tests for at least five years before any more positive statements can be made.

In spraying large areas the airplane is used, generally early in the morning because then the air movement is at a minimum and pilots can clear the tree tops by about 50 feet and can depend upon a fairly uniform distribution of the DDT over the target area.

For young plantations or small areas, the orchard-type sprayer may be used, and for very small operations, hand sprays or knapsack type sprayers.

In 1944, tests were made of the effect of DDT on water and wildlife. On a 40-acre plot surrounding a three-acre reservoir in Pennsylvania, DDT was applied at the rate of five pounds in five gallons of oil per acre. Within three days, three-quarters of an inch of rain had fallen. Water samples taken from the reservoir and from the tap of a nearby factory showed less than one part of DDT per million parts of water. Such small amounts of DDT constitute no health hazard. In fact, DDT is less hazardous to human beings than is either lead or fluorine.

The watershed area was studied to determine the effects of the DDT on other forms of life. It was found that the DDT severely reduced the population of most insects in the forest, but for the majority of species a sufficient number were left to repopulate the area. The spray had drifted into the water, covering it with a light film of oil which in a few hours was blown by the wind to one end of the reservoir. High mortality was recorded among a number of species of aquatic insects which were on or near the surface of the pond. Insects living on the bottom of the pond seemed to be unaffected.

Probably because of the mobility of the birds, no effects were noted to bird life, but the following day a number of leopard frogs and bullfrogs and a few sunfish were either dead or seriously affected. In 10 or 12 weeks, however, the fauna of the forest and the pond were back to normal.

More extensive tests made in 1945 showed that it is probably unsafe to apply more than one pound of DDT an acre over large forest areas.

In spite of their successes with DDT and other insecticides, forest entomologists are more enthusiastic about the possibilities of controlling forest insects by means of good silvicultural practices. It has been impossible in the past to develop the widespread intensive forest management necessary for testing silvicultural methods on a large scale. DDT now promises to be a good means for keeping down the outbreaks of heavy insect infestations until such time as forest management can be developed to the point where the forest areas themselves will be more resistant to insect outbreaks.

Muskrat

(*From page* 165)

$1 for fine grade skins. Even at that, muskratting was no penny-ante business. A good hunter could bring in from 20 to 200 muskrats a day, especially during the 20 days when mass hunting was at its best. A trapper's hunting limit was largely determined by the number of women folk in his entourage, back at his base camp, who were available to do the skinning and drying.

The techniques of skinning vary but little. The hide is loosened from the four paws, and pulled backwards over the head so that the thick, dark gray fur is inside. Into the cavity is slipped a rounded, carved board, broadly V-shaped, and the skin is pulled tightly and tacked down. Fat, grease and bits of flesh are carefully scraped off. Then they are leaned to dry against the sidewalls of cabins, sometimes laid in rows on the roof where the sun is warmest, or on the wire frames of fish wheels. On the second day the boards are turned over and drying is completed by the third day.

Miss Muskrat, toward the end of May, smiles coyly at her future mate. Male skins taken during this period are found pocked with holes inflicted by the sharp teeth of fighting adversaries. Obviously, this heralds the close of the muskratting season.

Through World War II, even more than during the first great conflict, muskrat skins proved to be invaluable for the inner lining of aviators' helmets and uniforms worn in the biting cold of the substratosphere. Also, wherever men fought on the cold Arctic fronts, in Russia, Finland, or our own Alaskan frontier, muskrat skins helped prevent the penetrating cold from incapacitating men.

It used to be, in the long ago, that the Indians caught muskrats by primitive traps and snares for their own use. From the soft, tanned skins the wise hands of dark-skinned women manufactured wondrously soft inner garments to be worn under caribou parkas. They sewed them with fine caribou gut and sinew. Today the native trappers trade in their skins for the white man's produce, for under the changing order the Indians are "going white," and this requires money to buy sugar and flour. For natives and whites alike muskrats have become the bread and butter of our vast northern dominion.

Again I seem to smell the fresh, crisp winds of the Arctic and feel the soggy crunch of my booted feet

along the dark Yukon tarns. There is the feel of a rifle in my hands, pushed forward as I round a bend beyond which may be a muskrat swimming about his business, or a flock of teal quacking contentedly in the lee of a sandbar.

The shadows of midnight seem to lie supinely across the broad golden waters, flecked with light from crimson clouds ranked, row upon row, across the pale blue skies. I almost feel the "bush" at my back, dark and mysterious as always, wherein the caribou are passing into the illimitable Arctic.

Once again, as the warm rains of the California spring beat on my study window, I take out my slides and run them through the projector, living again the hot quick summers, the long, long winter nights when the aurora borealis streamed across the verandas of darkness, and the exhilarating days of spring, when mallards and teal livened every lake with chatter, and the dark wedges of geese were etched across the sunset skies.

GI's Wood Pile

(*From page* 157)

eration from a forestry point of view, Colonel Oxholm made these observations:

In contrast to German clean cutting methods, the French depend chiefly upon judicious cutting practices and on nature for regeneration. Clean cutting of high forests is seldom resorted to, at least not in hardwoods. Each forest area of any consequence, and where it is under management (which means all state forests) is carefully surveyed and the land divided into cutting areas. A certain number of these areas are logged each year, but seed trees, usually from 35 to 40 to an acre, are left to provide new growth. Only occasionally is artificial planting necessary.

"Thanks to this system the forest owner can, after 20 or 30 years, revert to the original cutting area for a new crop."

Seed trees are left to grow to full maturity and furnish valuable raw material for French industries. This system is called *coppice with standard*. Such small growth furnishes fuelwood and mine props. The rotation varies from 20 to 40 years. Other hardwood forests are treated as *straight coppice* and may at times be cut clean in small areas, but the cardinal and inflexible rule is to cut hardwood timber smaller than eight inches in diameter with an ax, giving the stump an oblique or conical top.

This particular rule caused the 533rd more trouble than any other, he recalled, "because in spite of repeated explanations the German and Austrian wood choppers did not seem to understand that by using a saw on such small timber, rain water would collect on the stump, causing the rotting of the wood and threatening the future of the sprout growth. French authorities also demanded the cutting of stumps practically flush with the ground. So, in order to satisfy this demand and at the same time maintain production standards with unskilled labor, all trees in many areas were first cut with saws, after which skilled ax-men would go over each cutting area levelling off stumps in the manner prescribed by the French.

"Casual French visitors, uninitiated to this system, marvelled at the manner in which unskilled woodsmen were able to comply with their forest regulations."

Captured enemy material and French equipment made during war —and of wartime quality—were used by the 533rd group until the spring of 1945 when American machinery and equipment became available. "The prisoners of war never ceased

to admire the American axes and the curved hickory ax handles," Colonel Oxholm declared. "Or the highly efficient motor-driven American portable chain saws and, above all, the bulldozers which were used for road-building and snaking in logs."

Production per man per day practically doubled after the introduction of such equipment, and also as a result of experience which the woodcutters had gained.

Colonel Smith, the 533rd's commanding officer, designed a motor-driven buzz saw mounted on a jeep which proved to be highly successful. Another contraption which speeded production was an improved log cradle—six portable sections in which 40 to 50 small logs were placed, held together by chains, and the required fuelwood lengths of 39 inches cut by using the portable chain saws. "A cord of wood was cut in from five to ten minutes," Colonel Oxholm said, adding that "the method simplified supervision by hauling the logs to central cut-up points on the highway or railroad." This also eliminated piling since the wood was immediately loaded on trucks.

"The French were particularly touchy on the subject of seed trees which are marked in advance of each cutting operation," he said. "A standard penalty of 15 days of bread and water was imposed on any prisoner of war cutting a seed tree that was marked, but violations were so rare that no such penalty was ever enforced.

"Our greatest trouble was in preventing Germans from going to extremes in cleaning up the forest floor. If left alone they would pick even small twigs—but, of course, this was also another form of loafing. The fact remains, however, that the cutting areas were left in tip-top condition for regeneration, thanks to the German sense of orderliness."

The principal problem in the whole operation was transportation. "In the first place, the mud, particularly in Argonne, was bottomless," Colonel Oxholm said. "Then, we were always short of trucks, and those we had had already seen hard service and frequently broke down. This was unavoidable. We marvelled at the abuse which Army jeeps, trucks and semi-trailers would stand. And, of course, we never received trucks that would be more serviceable elsewhere."

In the places where no wagons or trucks could get through, large sleighs holding one to two cords of wood were constructed and pulled

by horses, oxen, bulldozers or tractors.

"In many instances," he brought out, "thousands of prisoners of war had to be relied on to carry wood down mountains or through swampy areas. The fact remains that in spite of mud and high water every stick of wood was brought to a railway or highway before rains, mud or snow made all transporting impossible."

German artillery horses captured in Brittany were hauled across France and used to good advantage by the 533rd group in the Argonne.

"The most important transportation problem," the Colonel recalled, "was solved through the construction of the Great Eastern and Bagetelle Railway which traversed the Argonne forest from west to east, with a branch line running north. Prior to the construction of this railway, the Argonne forest was impenetrable except for a county road which did not traverse the cutting area."

The railway made it possible to tap 110 thousand cords of firewood and other wood products, totalling 200 thousand tons. All the equipment—railway, cars, Diesel locomotives, rails, and even ties—were brought in from Germany after VE-Day.

Railway construction was undertaken in other areas, but not on such a large scale as in the Argonne.

Regarding the cooperation of the French Forest Service, Colonel Oxholm has this to say: "No one in the French government enjoys a higher reputation either professionally or ethically than members of the French National Forest Service. Perhaps centuries of tradition have something to do with it, or perhaps it is the constructive nature of their work, or the fact that the standing of each candidate is carefully scrutinized before he is admitted to the force.

"The thorough scientific background of French foresters is internationally recognized. They cover not only France itself but the vast French Colonial Empire. In time of war they automatically receive military status, and they have proved a most valuable adjunct to the French Army."

The private forest owners who were called upon for cutting rights also cooperated very well. "Outstanding among these," he declared, "is André Dubois of Paris, a large property owner and one of the most progressive industrialists of France. In his capacity as vice president of the French Forest Owners' Association, he was untiring in his efforts to secure cutting rights for the Army and received commendation by highest Army authorities for his action."

As for the 533rd group—well, the U. S. Army authorities were officially commended by the Director General of the French National Forest Service, General M. Leloup, on December 1, 1945. In a letter to Major General Robert M. Littlejohn, Theater Chief Quartermaster, he said:

"You have obtained important results without in the least causing damage to French interests. These accomplishments constitute a fine example of organization, procedure and technique."

As for the field commander of the 533rd, all U. S. Army cutting areas in the Argonne and Ardennes have officially been given the name of "Colonel Axel Oxholm," one of the greatest honors the French can bestow upon a forester.

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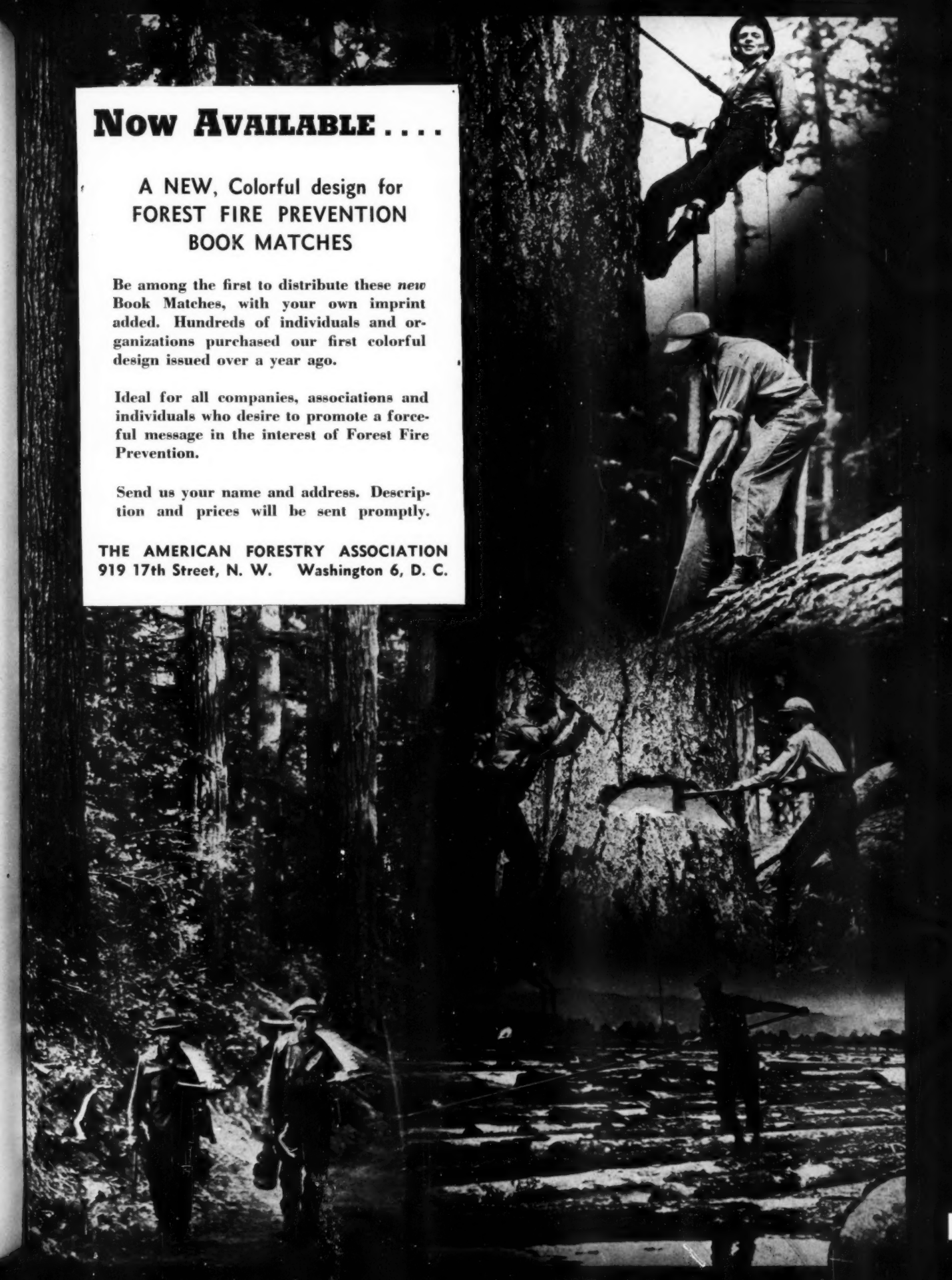

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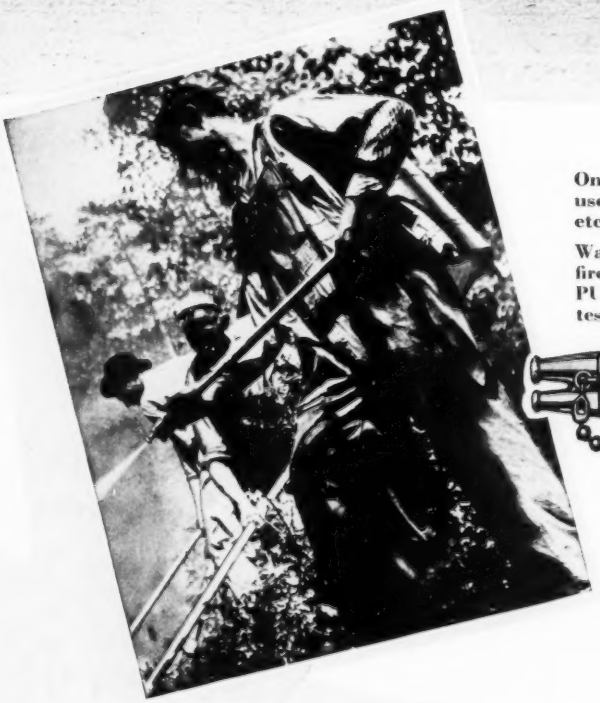

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